Place, People and Policy

Creating Policy Value from Complexity

by

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Statements and Declarations

Declaration of Originality

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Ethical Conduct

The research has been approved by the University of Tasmania Ethics Committee.

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Table of Contents

List of Figures

List of Tables

ABSTRACT

The thesis applies complex dynamic system thinking to the context of place, people and policy. The thesis aims to contribute to closing an identified gap in policy literature and practice; specifically exploring the theoretical and practical advantages of a policy development model that is more reflective of contextual reality. This research explores and demonstrates the development of policy with a particular focus on place and people.

The application of dynamic systems management to place, people, and policy is made viable through the development of a meta-framework that connects dimensions and their associated multiple perspectives. In particular, the thesis demonstrates how the use of a meta-framework can assist the representation, understanding, explanation and utilisation of the complexity derived from societal connections, dynamics and contestability to create value through the design, implementation and evaluation of policy. The combination of information and the meta-framework structure supports a narrative that links cause with effect at and between both the practice and strategic dimensions across activities and outcomes that are relevant to people. It further allows, and arguably requires, interests to generate narratives within similar constructs as the basis for community conversations.

The meta-framework is first elaborated and then applied to cases studies in different policy arenas. The case studies demonstrate the extension of what may simply be seen as a heuristic device for policy analysis into dynamic applications within place-based development. The cases combine literature with practice to reflect differing contexts:

- socio-economic pathways to new sectoral and community futures;
- industry fit to place, emerging values and thinking; and
- combining latent endogenous capital with emerging macro trends/policy to create new opportunity.

The analysis of the case studies supports the proposition that the introduction of a dynamic systems logic meta-framework into public policy making:

- can provide a framework within which to apply and further develop concepts and tools that are useful in supporting the integration of multiple perspectives and complexity thinking;
- can improve public policy performance and productivity, and contribute to improved resource allocation, and measurement of success; and
- can support the proposition that understanding complexity provides the potential to identify innovative policy initiatives.

CHAPTER ONE - INTRODUCTION

This research is motivated by the longstanding observation by theorists and practitioners that traditional public policy, administrative approaches, principles and mechanisms do not match the complexity of the "real world" environment within which they are required to create value and that there are alternate frames and approaches that would deliver improved policy and strategy performance and productivity value.

The thesis aims to contribute to closing an important, identified gap in policy literature and practice; specifically transforming the identified theoretical advantages of more realistic models of policy development into practice through the application of a meta-framework representation of the policy context based on a dynamic system construct applied in the context of place, people and policy. In particular, this research demonstrates how the use of a meta-framework can progress conceptual consideration of complex adaptive systems to a form to improve the representation, understanding, explanation and utilisation of complexity in both theory and practice. The research makes a contribution to theory and practice in addressing complexity, systems, multiple perspectives and engagement within a meta-framework that incorporates societal connections, dynamics and contestability in a manner designed to create value through the design, implementation and evaluation of policy.

The combination of research and project-based action learning represented in the case studies is designed to provide value to policy makers, managers of complex public programs and academics in the field.

Background

The world is increasingly "connected, dynamic and contested"; the complexity arising from these characteristics places significant challenges on existing policy making heuristics, models and processes. Traditional policy making has tended to reflect periods when these factors, although present, existed in a different, low velocity and limited scope, technical and cultural context.

In western democracies, people govern places, societies and communities by delegating and exercising power across a range of dimensions to achieve authority and legitimacy in making decisions that reflect societal interests and priorities (Lukes, 2005 (1974)). These formal institutions now find themselves challenged as the sole forms of legitimate authority in policy formation by very powerful civil society arrangements. The formative elements of these challenging institutions are the connections, interests and information flows that are made possible through the digitisation of communication and information.

Knowledge and information are increasingly difficult to quarantine within specific societal cohorts or institutions. This flow and the capacity to organise around competing values, interests and priorities changes the dynamics of policy making. Arguably the approach to

policy thinking and making must reflect this reality to be both effective and productive; this is the domain of heuristics that reflect the reality in which open, democratic society now works.

Formally designated places are generally managed in hierarchical and sectoral constructs, most often using a mix of reductionist mechanisms designed to generate administrative efficiency and political control through the delegation of authority within the dominant political and governing system and its policy settings. Bureaucratic and regulatory interventions occur with and is influenced by values, priorities and interests of the community and the markets (Colebatch & Larmour, 1993) and their omni-directional relationships and interdependencies.

The policy making framework has not adjusted to overlay or replace this sectoral construct with models more reflective of the dynamics and increasing contestability. To analyse this, it is important to consider the roots of contemporary policy making.

The role of policy has evolved as a "kind of theory" on which to claim legitimacy and to define and structure a rational base for action or inaction after consideration of facts (Parsons, 1995). What is really at stake in policy making in an advanced democratic society is the quality of life for individuals, communities and society in a context where those interests may not be homogenous in either scope or priority (Torgeson, 1986). The concept of homogeneity is further challenged by the scope and velocity of connections, influences and arising dynamics.

Policy making is not set and forget; policies can be perceived as legacies of previous authoritative decisions, earlier answers to earlier problems that are now perceived differently (Hoppe, 2018), not as innovative designs to influence the futures and help to better tackle day-to day problems.

Since the mid 20th century, governments within western democracies have increasingly expanded their roles. In particular they have engaged in functions viewed as essential for societal quality of life, individual wellbeing and sustainability within both their jurisdiction and extraterritorially through intergovernmental mechanisms. From these principles of responsibility and function, its governance structures, mechanisms and institutions have evolved to reflect a reductionist, siloed and technocrat delegated paradigm, with a focus on resource allocation and problem solving aligned to these constructs. Within this policy environment, the narrative and management of issues is contained within the silo and its institutions; generations of this approach to public administration and public intervention/investment has resulted in interest, discourse and engagement becoming similarly siloed and bounded by established perspectives and players who "are in the tent" (Hoppe, 2018). This structure of policy communities creating an environment that results in fierce competition to ensure that groups are able to gain traction for their specific interests, establish it on the agenda and to be actively engaged in the political and policy decision process. These, now traditions, diminish the silos openness to alternate perspectives, ideas and innovation; reinforced by an established professional and agent input focus and mechanisms such as global budget structures that reinforce the silos and rules for resource allocation that are "steady state or

incremental" in their construction, reducing competition for innovative or new budget initiatives of significant scales.

These general characteristics ensure tension between the policy development framework, processes, its formal institutions and the multi-perspective needs of society, their connections, dynamics. The contests of values, ideas and needs that arise within an open society, create a well-recognised mismatch between the societal and policy making systems.

Policy Frame Dynamics

Concerns over the consequences of a mismatch between policy development, societal characteristics and the interest/condition relationship has been long identified and considered by policy analysts. The inter-connected nature of "things"; society, interests, pressures and public policy; in particular the challenge associated with developing effective and productive public policy in an environment where connections between policy "agents and interests" are dynamic and almost instantaneous, continuously alters the distribution of influence and priority. Kingdon (1995) coined the term "policy primeval soup" to help describe the long term and opportunistic networks and alliances that are the manifestation of interests that arise to define, redefine and influence policy making. Kingdon identified this dynamic policy environment in the period prior to social media facilitating instantaneous access and flow of opinion, assumption and information that now exacerbates that complexity. This level and speed of connection and it's often associated contestability, arguably results in the "wicked problem" (Rittel & Webber, 1973) becoming the "norm" of the policy making environment; replacing the "problem solved" policy model.

In the early 1970s Rittell & Webber had identified and defined the proposition of wicked problem as the basis for comparison between "tame" and "wicked" problems. This was proposed as a means of differentiating between a relatively simple problem context and its potential to achieve a "problem solved" result and other problem contexts that are more complex and where some progression towards solution is the probable consequence of intervention; a result analogous to the Simon "satisficing" result (Simon, 1976). This satisficing outcome is linked to the "incremental" policy steps identified by Lindblom (Lindblom, 1959), and remains a dominant model of policy decision making (Bendor, 2015).

Arguably a satisficing mind-set creates the potential for lowest common denominator policy or pursuing a design approach focused on what is possible as opposed to policy which is aspirational and heavily invested in significant improvement in outcomes; identifying, arguing and capturing potential policy value.

This aspirational positioning is balanced with pragmatic policy incrementalism that results in an ongoing process where the performance of the intervention may be judged on the basis of whether the subsequent condition is better or worse than prior to the intervention and recursively changed, rather than viewing the policy as a finite or perfect solution (Rittel & Webber, 1973) (Hoppe, 2018). This progression reflects a realistic recognition of the scope of

influence and depth of problems, improved access to knowledge and increasing competition for resources to address these problems (Lasswell, 1970).

The relationship between societal connectedness, resultant dynamics. and from this contestability, is observed as a major contributor to the conditions identified by Kingdon, the response articulated by Rittel & Webber (1973) and the transition to policy development as a recursive process responsive to the dynamics and pressures. This process response has evolved into models such as "adaptive governance" (Chaffin, et al., 2014), an approach designed to address uncertainty through experimentation, continuous learning, involvement of multiple actors in decision making processes and the self- organisation of the governance system. This model while taking into account multiple policy perspectives, system dynamics and interactions between different components of governance (Rijke, et al., 2012) arguably struggles to connect and manage short, medium and long-term outcomes. Rijke identifies that the low uptake of adaptive governance largely relates to the inability of practitioners and policy makers to cope with complexity and various uncertainties and proposes a future oriented ''fit-for-purpose'' governance framework for assessing the effectiveness of existing and proposed governance mechanisms to fulfil their future purpose in a particular context. The arena is arguably in a state of flux, importantly theorizing a necessary trajectory from reductionist problem solving and standard governance models to models that are more systemic and contextual.

Rijke (Rijke, et al., 2012) reinforces a focus on both policy context and purpose, introducing consideration of complexity by combining temporal dimensions and multiple perspectives within context, itself determined by endogenous and exogenous factors and their influences. These socio-ecological systems principles are considered generally and broadly transferable.

There is an observable trajectory from problem solving, to process and then to systems frames as the basis for policy design. Dynamics, multiple perspectives, contestability and the resultant complexity have been long recognised as real world challenges that are not necessarily represented in both policy/strategy development models and in underpinning behavioural and economic analysis but remain largely unframed as a heuristic or meta-framework to translate this thinking into practice.

To highlight and create an understandable and workable metaphor, parallels have been drawn between the manner in which people interact within places and the characteristics of natural ecosystems interactions, vulnerability to exogenous shocks, adaptability and evolution; leading to consideration of the potential for complex adaptive systems (CAS) thinking to be applied to these arenas.

The complex adaptive systems construct draws significantly from life sciences and ecology and complementary frames of complexity science and its application to areas such as economic development (Carbonara, et al., 2010). While useful, social systems differ from biological systems in the use of reason and persuasion in effort to devise better rules (Ostrom, 1999) through utilisation of individual judgement or mechanisms including deferring to those with formal or informal authority, majority voting or relying on unanimity, factors influence by

culture, traditions and practice that add layers of complexity, not found in the biological system but as demonstrated above, not diminishing its utility as a frame. The combination of individual judgement with efforts to devise better rules identified by Ostrom, draws out the existence of multiple value sets, interests and perspectives as the basis of societal coalescence and tension, key factors in the description of the real world in which policy making occurs.

Economic thought is similarly from its simplified static and linear concepts and assumptions through dynamic iterations into the emerging field of complexity economics (Arthur, 2014) which introduces behavioural aspects and the concept of the economy being in permanently disruptive motion as agents learn, explore and adapt as the propagation of change through interconnected behaviour. Arthur introduces a definition of an economy *as "the set of arrangements and activities by which a society fulfils its needs"* (Arthur, 2013, p. 14), the challenge is how this "system" can be both represented and utilised as a socio-technical construct. This faces challenges on two fronts:

- The dominance of economics in public policy over other perspectives; and
- The focus on Gross Domestic Product (GDP) as an output and growth indicator which is the signal for national and locational performance.

The concept of progress measures that integrate social and environmental perspectives as complements to measures such as GDP have long been identified as important and since the mid 1990s been a significant focus at national and state levels. Achievement of acceptance as a valid option to guide the policy narrative and policy making has proven challenging within political cultures that take a foundational stance of society as an economy, rather than as a multi-perspective dynamic system.

Life science and behavioural disciplines have long experience in thinking in such frames, with notions of non-equilibrium and self-organisation, in particular with the observation that "no one external designer or manipulation from some centralised source of control directs these new patterns" (Cilliers, 1998). Small changes in some elements of an active system can alter the long term behaviour of the system (Holden, 2005), yet the robust nature of complex systems is their capacity to perform in the same way under different conditions, ensuring survival (Cilliers, 1998). Holden provides a definition of a complex system applicable to public policy analysis:

> *A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents. Examples include the immune system, a colony of termites, the financial market, and just about any collection of humans …* (Holden, 2005, p. 651).

The place, people and policy convergence on which this research is based, translates the CAS principles to a form that helps to represent, understand and explain the factors impacting policy in this context. This integrates analysis of how and why society in a place is structured, works and progresses within its overlay of culturally derived values, traditions and priorities and of how it responds to endogenous and exogenous trends and shocks and adjusts its policy and practice settings.

Western democracies have experienced over 70 years of openness to people, ideas and trade, arguably the governance structures and policy making models have not evolved in parallel. Open system thinking, a construct where systems are open to exogenous pressures in addition to the endogenous contests identified above, provides a means of considering key factors, patterns and connections within what could be otherwise viewed as a chaotic environment is proposed as a means to assist in addressing dynamics and non-equilibrium situations, as well as the contested nature of problems. Such concepts, theories and practices provide the foundation to deal with complexity arising from the interdependent, interconnected nature of place and interests associated with that place.

Holden's definition supports recognition of and accommodates complexity in the manner in which societal conditions are identified, considered and much policy development occurs. The translation of these frames into practice is inherent in the "sustainable livelihoods" (Scoones, 2009) model and the associated principles of the place-based models but which are also challenged by shortcomings in where the connection between and complementarity of mega-trends, macro and micro dimensions add to the understanding of connectivity. These exogenous and endogenous factors and their complementarity as policy determinants and intervention opportunities is increasingly recognised and included in policy models and approaches.

How people inhabit, form societies and sustain livelihoods, providing for their quality of life and wellbeing is crystallised within "place" and its inherent, multi-perspective, systems context, as a policy construct to address shortcomings of sectoral or structural policy frames, in particular at the regional level. A shift from an "old paradigm of regional development" that sought to compensate lagging regions to a "new growth oriented paradigm" based on the principle that that all places have the potential for economic growth through the application of "place-based development policy (OECD, 2009). The Australian Productivity Commission (Productivity Commission, 2017) concludes that the historical focus on a limited range of development interventions, in particular infrastructure in preference to initiatives focused on or including intangible capitals do not necessarily reflect the context, or complexity of a place and achieve the best return; these conclusions are consistent with the concerns driving and principles contained within the OECD approach (OECD, 2018).

The emergence of dynamic systems thinking across a range of complementary disciplines indicates a propensity for, and progress in, the activation of these concepts into practice.

System and reductionist approaches are also considered highly complementary. Elements of an eco-system do not all respond to the same change signal, nor at the same rate, some do not respond, the response to change is not universal. An understanding of the building blocks and internal models (Ostrom, 1999) that frame how society works and their potential for dissembling and resembling to create new options and innovation, also allows a specific block to be removed from the system for analysis and prior to final decision, replaced into the system to evaluate how the decision may further propagate through the system. This introduces cause and effect in socio-technical perspectives and in time dimensions, provides for simultaneous consideration of acute and chronic issues. This unique capacity of systems

approaches enable the understanding of complexity to alter the policy stance from adaptive to dynamic; an active form of response based on the reasoning capacity that differentiates the social system from the biological. The role of stimulatory policy, at the macro level performing specific catalytic roles, or at the local level creating incentives are relatively common and focused on specific dynamics that demonstrate policy intervention as a longstanding, dynamic, goal-oriented tool rather than one that supports adaptation. These stimulatory policies provide both tangible impact and send signals that propagate through society, designed to stimulate behavioural change. These "nudges" build on the potential to stimulate changes within group and individual norms and in addressing the constraints of "bounded rationality" (Lodge & Wegrich, 2016) to act as a catalyst for innovation.

Focus of this Thesis

Aligned with the progression from reductionist towards complex adaptive systems frames for policy making, a wide range of partial responses to reinforce multiple perspectives and interconnectedness have emerged. These include socio-technical systems, program logic, the triple bottom line and major themes within decision making and associated behavioural science. Each achieves a level of utility and adoption within policy thinking and making but wax and wane in terms of popularity, intensity and consistency in application.

While approaches to policy thinking and policy making are evolving, the interconnected nature and dynamics of the policy and place contexts are intensifying. Digitisation has disrupted the generation of information, its velocity, dispersal and access characteristics has increased the importance of understanding and utilising the "connected, dynamic and contested" factors that influence how places work; characteristics that have long been the focus of those who govern and make policy. Arguably, policy approaches and frameworks need to and should evolve to address the challenges which have emerged and be prepared for the ongoing disruption that further digitisation will deliver in both increasing connections, dynamics and contestability and in governing within this context.

Hypothetically, some form of dynamic systems framework, more reflective of the complexity of the policy environment and the evolving theory, principle and practice introduced above, may provide a more effective representation of society its connections, dynamics and co-operation/contestable context than that traditionally used for policy and strategy development.

While reductionist and often linear approaches have dominated governance, broader complexity has still been managed (or mismanaged) in less formal, less institutionalised ways by people utilizing and developing heuristics that match their values, experience and priorities (Bendor, 2015); the fundamental question is whether "systems thinking" and its inherent complexity can be framed to enable approaches and mechanisms more reflective of the context in which governing occurs as the basis for policy development.

Within this thesis, a particular form of a dynamic systems logic and thinking meta-framework reflects a heuristic to support public policy theory and practice development. This provides a

framework into which tools such as the triple, bottom line, socio-technical thinking and program logic can fit and combine to assist in representing, visualizing, understanding and explaining context as the basis for design and implementation of multi-perspective policy and strategy within a selection of place-based themes.

This proposition addresses gaps in bridging theory and practice; in particular in how CAS concepts are practically activated. For example, how a CAS might be structured and how it might then be utilised in representing, explaining and creating value from the complexity derived from technical and social connections, their dynamics and associated contestability. These characteristics can be utilised to help develop policy and strategy that better reflects and works within the real world and its multiplicity of perspectives and dimensions.

The motivation for, and research focus of, this thesis is whether the application of a heuristic framed as a dynamic systems logic, can improve the representation, understanding and explanation of the complexity evident in real world patterns of interconnectedness, dynamics and contestability within places, as the basis for the design, implementation and evaluation of policy.

This research, and the associated case studies, is designed to question whether CAS characteristics can be transformed into a structured heuristic in the form of a dynamic systems meta-framework to support the development of policy and strategy with a particular focus on place and people.

The thesis explores this proposition with a particular focus on place, people and policy and the potential to create value from understanding and utilizing complexity. It has a specific focus on place-based policy and the interests of policy makers, managers of complex programs and academics in the field.

Research Design & Method

A key design principle is "form follows function". This integrates purpose and context; within this thesis purpose is represented by the research question and context framed by the convergence of CAS, place and the specific ""connected, dynamic and contested"" characteristics of place; an understanding of which are considered central to meaningful and efficient policy and strategy development.

This thesis focuses on an exploratory and explanatory research question:

> *whether the application of a heuristic based on a "dynamic systems logic" can improve the representation, understanding and explanation of the complexity evident in "real world patterns of interconnectedness, dynamics and contestability within places" as the basis for the design, implementation and evaluation of policy.*

The context for this exploration is premised on the application of CAS characteristics as a useful means of representing and analysing place to achieve improved understanding and explanation to support policy decision making. It is within this complex context within that the research question is progressed. As the foundation for the clarification of a valid research

design and method, the key characteristics and their characterisation within the "connected, dynamic and contested" taxonomy are outlined below.

Walker provides a valuable definition of a complex system applicable to public policy analysis:

> *A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents. Examples include the immune system, a colony of termites, the financial market, and just about any collection of humans …..* (Holden, 2005, p. 651)

The policy antecedent of a complex system is the presence of a significant number of agents able to interact and the adaptation that arises as a consequence of that interaction (Holden, 2005). To this end Cilliers (1998) offers the following characteristics of a complex adaptive system:

- A large number of elements interact in a dynamic way with much exchange of information;
- These interactions are rich, non-linear, and have limited range because there is no overarching framework that controls the flow of information;
- Complex systems are open systems with feed-back loops, both enhancing and stimulating (positive), or detracting, inhibiting (negative) where both kinds of feedback are necessary;
- Complex adaptive systems operate under conditions far from equilibrium, which means there is continual change and response to the constant flow of energy into the system;
- Complex systems are embedded in the context of their own histories, and no single element or agent can know, comprehend or predict actions and effects that are operating in the system as a whole;
- Complexity in the system is a result of the patterns of interactions between the elements.

Cillier's characteristics are particularly pertinent to current societal characteristics, in particular:

- The internet and social media provide a means for like-minded people to interact at many levels, co-location is unnecessary, there is no meaningful time lag between event and receipt of communication;
- The use of the web as a means of publishing, consolidating and accessing communication has resulted in contemporary and wide ranging knowledge, discussion and interpretation is available to many, diminishing the "positioning of experts" as the primary source of specialist technical information, interpretation and the framer of narratives on which decisions are made – people from "outside the system" can now engage in decision forming activity;
- As a consequence of knowledge and organisation people from outside the system challenge the appropriateness of decisions within the context of their values and as part of this the legitimacy of the systems institutions and agents.

These characteristics and influences are considered well matched to the policy environment as summarized in the following table. The table categorises Cilliers complex system characteristics within the three key meta environment concepts – "connected, dynamic and contested" that form the foundations of this thesis.

Table 1.1. The Characteristics of Complex Systems

Complex System Characteristics
Connected
• **A large number of elements interact in a dynamic way with much exchange of information;**
• **These interactions are rich, non-linear, and have limited range because there is no overarching framework that controls the flow of information;**
• **Complex systems are open systems with feed-back loops, both enhancing and stimulating (positive), or detracting, inhibiting (negative) where both kinds of feedback are necessary;**
• **Complexity in the system is a result of the patterns of interactions between the elements.**
Dynamic
• **A large number of elements interact in a dynamic way with much exchange of information;**
• **Complex adaptive systems operate under conditions far from equilibrium, which means there is continual change and response to the constant flow of energy into the system**.
Contested
• **Complex systems are embedded in the context of their own histories, and no single element or agent can know, comprehend or predict actions and effects that are operating in the system as a whole**.

Unlike the natural eco-system, a place is populated by people and their unique capacity to not just adapt, but to innovate and create introducing a dynamic that is both responsive and active. As a consequence, cause and effect relationships are more complex, omni-directional and more challenging to identify and analyse.

This dynamic capacity is a function of the natural and community capitals inherent in a place for immediate utilisation or with the capacity to be developed for future utilisation; these are the socio-technical foundations of place based on resources, culture and behaviour. As a consequence of this socio-technical construct, an understanding of how a place is structured and works, as the precursor to policy development, requires more than an understanding of the transactions that occur, it requires an understanding of the complementary levels of social engagement and interaction.

The research frames the concepts of "connected, dynamic and contested" as the interdependent complexity variables that are the critical factors that impact the development of place and complementary policy and strategy and the focus of the conclusions chapter.

The meta-framework provides a visual representation of the elements that comprise the system, this enables identification of omni-directional dimensional and perspective

connection. The associated leads and lags are the sources of internal dynamics, while the impact of external shocks that create a signal in a specific element(s) which then propagate through the system captures the external/internal connections and dynamics.

The velocity and force of the dynamics as the response to endogenous and exogenous shocks and trends is influenced by the degree to which the signal is contested. Contested is utilised as a relative measure ranging from agreement/cooperation through ambivalence to disagreement/highly contested. The level and nature of contestation is technically and culturally dependent; with response resourced through the stock and flow of community capitals towards the signalled change.

The research methodology reflects the context created by the place-based policy arena, reflecting an open exploration aimed at gaining a depth of understanding that while focused through the research question is not bounded and limited to narrow causality.

The scope of this need extends beyond that of traditionally used statistical analysis and econometric modelling that form the basis of quantitative research to become a strong fit to the attributes of qualitative research, in particular the use of case studies as the primary research method. As Eckstein Notes "case studies are generally strong, precisely where statistical methods and formal models are weak, particularly in addressing causal complexity (George & Bennett, 2005). The representation of place as a complex adaptive system brings together multiple environmental, economic and social perspectives as interdependent elements that are both technical and social in their interdependencies. These settings and associated complexity draw into question the appropriateness of traditional partial and simplified quantitative modelling as a method to provide the insights necessary to represent places and their development pathway options.

Case study research has existed alongside quantitative research and in the led to increased integration of quantitative and qualitative methodology with the aim of theoretical development and testing (George & Bennett, 2005). The choice of case study focus reflects Yin's observation that "case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 2003, p. 1). Given the exploratory nature of this thesis, the application of qualitative research is further supported, however the importance of variation, a key focus in quantitative research, is considered important within the context of this research. George and Bennett recognised that "a well-defined research objective and appropriate research strategy to achieve that objective should guide the selection and analysis" of the cases (George and Bennett; 9).

Places vary, so the concept of "real world" as a descriptor of characteristics, interdependencies and dynamics that represent places requires some form of variation within the research context; within this thesis the application of multiple case studies, in both location and purpose, is used to provide a variation in purpose and context to the application of the heuristic.

The research design was considered within the multiple objectives of meeting the necessary requirements for demonstration of utility and the transformation of CAS principles from abstract to concrete forms and from the general form to specific application within place-based development and subsequent contextual/thematic specification; exploring a contemporary policy phenomenon within a real-life context (Yin, 1995) (Yin, 2014).

The nature of this thesis matches the application of case studies and their strengths and versatility in enabling comprehensive qualitative inquiry of a complex issue in context, in particular where the boundary between context and issue is unclear and contains many variables (Yin, 2014). The exploratory and explanatory capability of case studies assist in developing understanding of issues in real life settings (Flyvberg, 2011) (Yin, 2014): in short as Yin points out you "use the case study method because you deliberately want… to cover contextual conditions" (Yin, 2003).

The attributes of case study research combine to conclude that case studies provide a robust method to research the utility of systems thinking to place-based development. As Yin comments "case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 2003, p. 13).

Case studies are a very traditional social science research approach and increasingly recognised as being effective in investigating and understanding real world issues and settings (Harrison, et al., 2017). This attribute is important given the variation in for example, structure, culture and resultant context and complexity, that is inherent in, and differentiates places, in particular where human behaviour and social interactions are as evident as they tend to be in place development (Yin, 2014).

These studies provide a means of creating a juxtaposition between the application of the meta-framework to real-life situations, a characteristic identified as important to ensure (Flyvbjerg, 2004)

- nuanced views of reality; and (Harrison, et al., 2017)
- the researchers own learning to further evaluate and refine the meta-framework is supported.

The analysis phase employs multiple, empirical case studies applied in a paradigmatic form (Flyvbjerg, 2004) (Harrison, et al., 2017) aiming to explore, seek understanding and establish meaning through the integration of the heuristic and the place-based the meta-framework and the OECD Rural Policy 3 reflection of the new rural paradigm.

The projects underpinning the cases were each developed with collaboration with the commissioning client, staff and community and sectoral stakeholders, including representatives of responsible government agencies utilising a mix of briefings, structured an open discussion and multiple workshops up to a day's length. The constant through these projects was the utilisation of the meta-framework and associated tools within collaborative

multi-disciplinary and participative processes as the specific phenomena under investigation (George, 1979).

The case studies and their key outputs form the foundations of subsequent analysis against parameters identified within the research question. They were based on multiple method research and participation, including document review, data analysis, structured interviews with key participants and workshops. The balance between these methodologies was altered to reflect the purpose and context of the project. Within each case study project, the author was an observer as participant, arising from the researcher's consultant, facilitator, observer roles.

The general notion of participant-observer is one of interaction to generates data based on immersion in the field (Harrison, et al., 2017) Is a widely utilised social research methodology within the development of case studies (Kawulich, 2005) This combination with is consistent with longstanding view that the participant observer role contains a number of methods and techniques, including observation, interviewing, document analysis and participation with self-analysis (McCall & Simmons, 1969) and that the researcher accepts a role within the social situation being studied (Hargreaves, 1967).

The variation in the participant observer role is also long recognised and categorised. Within the case studies the author's role is categorised as taking the *observer as participant* stance within the following four categories on a continuum of observation stances (Gold, 1958):

1. Complete participant – a member of group, who conceals their role to avoid disruption. In addition to the ethical failure, questions relating to objectivity are identified within this stance;
2. Participant as observer – a member of a group aware of the research. The potential trade-off between depth of data and confidentiality is identified as a challenge in this stance;
3. Observer as participant – this stance enables the observer to participate in the group while the group is aware of their role. This stance is identified as enabling better observation and generating more understanding; and
4. 4 Complete observer – where the researcher is completely hidden from and unknown to the participants.

Notwithstanding the observer as participant advantages identified, the potential for researcher verification bias (Flyvbjerg, 2004) is recognised and was addressed by:

- Recursive literature review and focus on issues arising from this literature;
- A descriptive (Yin, 1995) focus to the representation of the case studies, demonstrating the application of the meta-framework and associated tools, identifying how connections between these structures, frameworks and processes contribute to addressing key issues identified in literature. These issues are positioned as prior propositions and therefore categories on which to systematically analyse utility of the meta-framework in assisting to represent, understand and explain the "connected, dynamic and contested" variables within the cases;

- Focusing on context, outputs, application and activation of the meta-framework derived from participant, observer mutual knowledge bases (Flyvbjerg, 2004) applied within the cases provides a bias free demonstration of utility within the context of the research question.

The research profile was designed to address contemporary place development challenges and is based on cases drawn from Tasmania. It integrates the cases with policy and place development literature and the challenges of connecting place-based development with the broader macro policies of national and state/regional government. International experience and literature are included and contextualised within the cases.

From a diverse range of projects founded on the meta-framework approach, specific cases providing a fit to the EU Rural Policy 3 and the OECD new rural paradigm were chosen. The selection of multiple cases supported the exploration of three place-based themes:

- Place-based development to a defined multi-perspective future state. This is consistent with the Rural Policy 3 goals, stance and practice to develop place-based development policy that is also reflective of macro-policy and market stances but reflective of place context;
- Industry in place, the strategic and practice impact of structural, value and positioning dynamics. This case focuses on the sustainability of an industry sector in the face of changing societal values and priorities and the resultant change in stance within the industry, community and policy that affect its future. In this instance the heuristic representation was developed from the original project into three forms reflective of the evolution of the industry and forward into a developing focus on the consideration of the abalone sector as one part of a system focused on sustainability of Australia's rocky reef system based on emerging literature; and
- Creating place-based capitals value and opportunity by linking macro tends and policy with local potential. This case draws together the potential to use latent tangible and intangible resources that exist within a place and their potential to jointly create socio-economic activity and be utilised to create knowledge and skills that enable people to participate in "new economy" business and employment opportunity.

These themes and cases provide a diverse range of contexts within which apply, explore and explain the results of the associated heuristic, process, the representative structure and the policy/strategy and implementation frames that emerged.

The research draws content from these case studies and places it within the "connected, dynamic and contested" foundations of complexity and the utility of the meta-framework and its associated application in representing, understanding and explaining complexity.

This places the heuristic at the centre of consideration of the purpose and context of each case study enabling this thinking to be translated into a meta-framework or set of complementary frameworks that represent either:

- The specific challenge
- Industry/issue frameworks that are contextually complementary in terms of achieving place based strategic objectives;
- Sequential frameworks representing evolution of industry in response to internal, external societal and market factors and shocks and over the longer term, in response to changing societal perceptions, values and influence mechanisms.

These provide the framework that provides the foundation representation of the interdependent dimensions and perspectives that frame the policy context. They are informed by interviews, document review and data analysis that provide input into workshop sessions for further input and analysis upon which to "build" the meta-framework representation based on the heuristic.

From this representation two further tools are applied to clarify the contribution of "on-ground activities" to the multi-perspective outcomes sought, in both positive and negative terms. This strategic context then supports consideration of how a mix of capitals can be directly applied to the on-ground activity to contribute collectively to outcome targets. The representation and strategic/operational dimensions and connections are developed in participant workshops.

Inherent in these case studies and the workshop processes are the contextual questions of and challenges identified in considering and applying questions and challenges associated with CAS, the OECD Rural Paradigm and EU Rural policy frameworks and other identified in Chapter Two, following.

The cases were then subject to further review, independent of the associated stakeholders to consider their utility in understanding and explaining the "connected, dynamic and contested" characteristics associated with CAS and interpreted through the meta-framework and associated tools.

The thesis is structured as follows in accordance with this design and method.

The research progresses through three phases to bring the case studies into this thesis form.

- Public policy literature review and the subsequent design rationale for the general form of the meta-framework;
- Transformation of the general form into a place-based meta-framework and its connection to place-based development literature; and
- Multiple, qualitative case study narratives, analysis and conclusions. To provide specific empirical evidence

This research and its application and consolidation helps addresses the research question by providing cases that explore and demonstrate the application of the heuristic, its transformation into meta-framework form and associated tools, which, in combination with multiple methods applied in a collaborative setting can transform the principles of a CAS

can improve the representation, understanding and explanation of the complexity evident in "real world patterns of interconnectedness, dynamics and contestability within places" as the basis for the design, implementation and evaluation of policy.

Structure of the thesis

Chapter Two: Foundations

Chapter Two provides the theoretical public policy foundations to the research. It establishes a normative perspective on the role of public policy and progresses policy making theory from its consideration as a problem-solving event, the recognition of reality as satisficing and incremental decision process through to concepts of and parallels between the policy making context and complex adaptive systems. This is followed by a review of complexity thinking and engagement models that have emerged in both policy and organisational contexts. The theoretical concepts, principles and characteristics are integrated to design a policy making heuristic in the form of an adaptive systems logic meta-framework.

Chapter Three: Regional Development application

Chapter Three transforms the general form of the meta-framework into a place-based form. This integrates regional and place-based development theory and practice, with particular reference to the OECD "New Regional Paradigm" and "Rural Policy 3" as the basis for specifying and populating a general place based meta-framework representation.

The approach and processes that assist to activate and utilise the meta-framework in practice are described.

Chapter Four: Theme One - Place-based futures

Chapter Three features place-based development case studies:

- The Northern Tasmanian Settlement Strategy;
- The Derwent Valley STEP (Social, Tourism & Economic Plan);
- The Coal Valley Tourism and Bio-Economy Zone Strategic Development Framework; and
- The Launceston Cities Deal.

The meta-framework has been utilised within each of the projects to provide the thinking framework, stance, structure, content and the focus of the associated recommendations within the context of the briefs.

Each of the first three cases consider them in the context of the previous literature review, the New Rural Paradigm and Rural Policy 3.0. The Launceston Cities Deal, as the fourth application, considers the utility of the meta-framework within a functional urban context, one targeted within the Australian Government's Smart Cities Policy and its associated Cities Deal Program.

Chapter Five: Theme Two - Industry in Place; common pool resource utilisation

Chapter Five applies the meta-framework to representing and explaining the establishment, evolution and development of the Tasmanian Abalone Industry as an example of "industry in place". Applied in evolutionary phases over a 50-year time-frame, it provides an opportunity to consider sequential meta-framework representations of those phases. These demonstrate variation based on the interrelationship between the industry, the population and its interrelated values and priority dynamics. This case raises definitional aspects of both place and natural resource definition, impacting both policy focus and management.

Chapter Six: Theme Three - Macro-policy and place-based potential

Chapter Five focuses on the interdependency of place-based development and wider macro conditions and policy. and within this context considers the potential for regional places to participate in the robust and growing service economies characterised by larger cities. The context of place, as expressed in Australia's regions supports the potential for a hybridised economy where the balance of traditional primary production and community services with higher value services and the associated enterprise and employment opportunity.

The Chapter addresses the challenge of enabling regional communities to access skill and enterprise development opportunities consistent with the "new economy and creative industry" opportunities that characterize large cities.

Chapter Seven: Analysis

Chapter Seven analyses the application and utility of the meta-framework approach in assisting to develop policy and strategy that reflects "real world" characteristics as demonstrated in the case studies. In particular the manner in which it assists to identify, represent, understand and explain place and people connections, dynamics and contestability necessary for meaningful place-based policy and strategy intervention.

Firstly, the factors associated with the connected, dynamic and contestability aspects are identified to form the basis for the analysis of the contribution that the meta-framework approach makes. Secondly, the case studies are considered in terms of the value of the meta-framework and subsidiary tools in assisting in the representation, understanding and explaining the complexity factors as a pre-requisite for policy/strategy development.

Chapter Eight: Conclusions

Chapter Eight draws the primary conclusion to the research question and subsidiary conclusions in relation to the utility and implications of the of the primary finding to:

- Complexity thinking and engagement models;
- Practitioners; and
- Researchers.

It further discusses how complexity is considered and represented in policy making to enhance understanding and explanation as the basis for policy making and implementation.

Chapter Eight concludes with a reflection on key factors relating to future implementation, practice and theory development to ensure the meta-framework approach can create value.

This following chapter commences the process of applying the methodology and structure described above by reviewing and analysing the public policy foundations underpinning the search for more realistic and productive approaches to policy making.

CHAPTER TWO – FOUNDATIONS

Introduction

This chapter provides the theoretical foundations to the research, progressing from a reflection on the evolution of literature and practice of how public policy development is approached and made; an evolution of approaches from positioning policy as "problem solving" through to the potential for the application of systems thinking as a means of developing policy that better reflects real world complexity and therefore produces better policy.

This theory and practice progression frame the proposal for a dynamic systems logic meta-framework to support the representation, understanding, explanation of complexity as the basis for design of public policy within context. A general application is presented in a form that, in Chapter 3 is transformed to reflect the concept of "place" to provide the subsequent focus and case studies to support the analysis and conclusions in relation to its utility.

The structure of the chapter is designed to introduce the key literature, linkages and connections to the key themes of this thesis:

- the inter-connected nature of "things" within society and thus the public policy environment;
- the complexity of the relationships between the policy structures and the culture, values and practices of society, competing interests and intervention role of public policy to alter micro, meso and macro conditions; and
- the impact of both exogenous and the above endogenous connections, the resultant dynamics and subsequent contestability.

The complexity arising from the connections, dynamics and contestability framing core challenges to policy practice relating to:

- the potential value of utilising alternate, complementary thinking and approaches to productively respond to and create value from this complexity;
- how to represent and visualise this complexity to enhance understanding of its scope, conditions, connections, interdependencies and dynamics; and
- the opportunity for more productive public policy mechanisms as a result of recognising, representing, and responding as an instrument intervening in a complex adaptive system.

These themes provide a foundation for considering how to integrate multiple public policy perspectives reflecting different views, values and conditions. This integration capability occurs as consequence of the evolution of public policy development approaches from:

- policy making as a problem solving event, a subsequent proclamation of the solution and movement to the next issue, through to;
- a recognition that problems recur and redefine, requiring re-assessment and that policy making is a recurring process for providing an interim "fix", towards

- considering policy as an instrument that adds value within a complex adaptive/dynamic system.

This progression is discussed in the following sections:

Foundations of Contemporary Public Policy Analysis

Policy making exists as a means of establishing direction and control for some defined or implicit benefit. Over time this achievement of interest and execution of power has evolved in elaborate mixes of institutions, mechanisms and processes within which power and values are legitimately applied within the policy context. Although somewhat simplistic, this perspective nevertheless captures the existence and interaction of beliefs, values, interests, power, institutions and process operating under an overlay of legitimacy that is central to the development of public policy that can be productively enacted.

The concept of public policy within modern liberal democracy encompasses three fundamental elements;

1. policy is contributed to and made by those with legitimate authority;
2. exercise of that authority carries with it accountability to the public (Parsons, 1995) and
3. that public policy seeks to deliver public benefit.

The central role of policy within and from politics, is positioning policy as a 'kind of theory" on which to claim legitimacy and to define and structure a rational base for action or inaction after consideration of facts (Parsons, 1995). Torgeson, identifies that what is really at stake in policy making in an advanced democratic society is the quality of life for individuals, communities and society in a context where those interests may not be homogenous in either scope or priority (Torgeson, 1986). A primary question is who and what defines quality in a context where distribution and redistribution of resources, costs and benefits becomes the defining challenge in policy to arguably the mirror societal values and priorities.

The Torgeson "individuals, communities and societies" construct, introduces some explanation of the source of tension between aggregate benefit to cost, where a positive result can be that the losses suffered by one group are more than off-set by gains made another, and "Pareto optimality" where the goal is to make one better off, without making another worse off. The Pareto-efficient position being the frontier position where additional gain to one, will then not be off-set by a loss to another provides a principle and benchmark.

These themes and challenges reinforce the importance of framing and understanding the specific policy environment and its parameters in a form that can be both represented and then perceived as relevant, acceptable and beneficial within the context framed within associated values and priorities. This need applies equally to the policy maker and those outside this formal domain wishing to influence policy (Kingdon, 1995) if they are to be successful in their respective objectives. The linked concepts of values and broad benefit/cost relationships underpin the perception of relevance, acceptability and benefit in the identification of need, priorities, what is possible and subsequent design, implementation and

evaluation of public policy. Within this frame the question of whose values and interests are dominant (Hoppe, 2018) within or are influenced to drive the policy intervention and associated justification narrative is a critical political overlay of the technical form of the policy process.

Policy analysis has occurred as a key parallel focus to policy making, albeit as largely an informal field of research until its development as a formal field of study since the mid 20th century. Policy analysis, as a formal field of study, can be traced back to the 1939-1945 world war years, in particular to the introduction of operations research (OR), and techniques of economic analysis (Parsons, 1995) applied to defence capability. Operations research (OR) derived from mathematical approaches to the optimisation of activities and process using techniques such as linear programming emerged as powerful tools within which cause and affect relationships were utilised to provide increasingly predictable results; the use of probability theory assisted in establishing result boundaries within the wartime governance and decision-making context. Key tools in industry and logistics, these approaches supported decision making in the industrial underpinnings of war time success and were the basis for designing an optimal mix of production and logistics effort. OR is technical in nature and that it gained eminence in an environment where the "end game" was both clearly defined and largely viewed by all of the dominant actors as an agreed outcome to be achieved by an agreed approach.

Techniques such operations research and associated, complementary modelling techniques have been a key element of scientific management and demonstrate the lineage of the industrial era's emergence from the mid 19th century and as a triumph of science and the application of scientific, rational thinking. The transition from cottage to mass production based on rationality arguably occurred through the implementation of physical sciences and integration with scientific management principals to the management and interaction of people, technology and process, a convergence of technical and social sciences that evolved into management theory. In effect these approaches, the ascendancy of science and 'rationality" emerged from 18th century enlightenment and scientific method applied to the natural and technical sciences, the philosophy of enlightenment and the associated values base led to "rational" approaches and forms of organisation for state, commerce and industry (Weber, 1991).

It is only a short step from the successful application of such scientific and rational approaches in industry to the exploration of these concepts in the development of policy, in particular when the approach had proven valuable in solving the "problems" of the Second World War. The "war" context provides an abundance of crises and problems but also creates a single, rational goal; a characteristic arguably missing or reduced, but often fabricated in other contexts. The success of these technical approaches resulted in their wider adoption post-war in both private and public sectors in a post-war environment within western democracies where outcomes and the approaches to achieving them became increasingly less definable and agreed upon; and in many instances more highly contested.

Supported by the concept of certainty, linearity and the perspective that past relationships are useful predictors of future outcomes when specific changes are introduced, the rational constructs and models, proven valuable as industrial management tools, gained traction as government focus on planning increased. As part of this the role of the technocrat became dominant, specialisations narrower and lay knowledge less involved on policy development. These approaches included simplifications, narrowing of policy dimensions and organisational silos which combine to produce technical models where complex problems were customarily reduced to decisions based on use of limited variables. While these approaches have delivered value in decision support, such simplification means that they do not necessarily reflect the reality of the decision environment (Batie, 2008). In essence such approaches have traditionally treated problem solving as a technical, problem solving process, combining resource allocation with tangible activity, to the exclusion of important social and intangible dimensions, determinants and consequences. In doing so they can create significant tensions including those between those who are part of the system and those who have been marginalised or excluded as well as between the focus of the intervention and other unrecognised interdependencies; a source on unintended consequence itself at times, unrecognised. Hoppe notes the self-referential (Hoppe, 2018) nature of policy making within bureaucracies that have an interest in "government itself" and the use of a limited range of standard policy formulation tools, checklists and policy designs drawn from the range of recognisable resources available. This observation reflects an inward focus to policy making, limiting the propensity for both outward looking, innovative designs that positively influence people's future (Hoppe, 2018).

The focus, dominance, appropriateness and limits of a delegated, technical and professional policy development frame arguably designed for complicated, large scale problems where there exists a critical, unambiguous goal to a societal context where the focus is on improving the quality of life of individuals (Torgeson, 1986) and its diversity how quality is defined, almost regardless of context has become a core focus of policy analysis.

While delivering value in a range of controlled contexts, the rational, linear and technical approaches have been found to be unsuitable and ineffective in other contexts (Arthur, 2013). This propensity for poor benefit to cost returns from these reductionist approaches when used in "uncontrolled contexts" provides the motivation to explore how we think about thinking about policy, the foundation for how these approaches and tools can be more productively utilised and new approaches and tools can be designed, within contemporary and emerging societal characteristics - meta-analysis.

Meta Analysis

This section considers the relationship between the expectation of policy as problem solving, the introduction of dynamics, satisficing and process and the consequences of recognising complexity.

Problem – Solution – Solved; It's Rational

The "problem solving" approach developed within and reinforced, a period in which government was largely perceived as a problem solver and the political system was seen as a problem-processor (Parsons, 1995). This concept was reinforced through the use of Keynesian economic policy settings, a policy set proven useful in terms of understanding the relationships between government intervention and employment and income outcomes is consistent with Parsons conclusion that policy analysis evolved in era in which government was seen as a "problem solver" and the political system was seen as a problem-processor. The implications of this starting point are profound, highlighted by Hope

'The typical American word for an unsatisfactory social state is "problem" something, that is, which can be solved and thereby disposed of: and the typical word for ameliorative social action is a "program", something that is, which has a pre-ordained beginning, middle and end." (in Sharpe 1975: p16)

A key question is whether the crisis context within which policy analysis "was born" has arguably framed how it has evolved within the following two basic premises:

- Problem solving; and
- Problem solved!

The problem context is fundamental to both policy making and policy analysis. The concept of a "problem" arguably contributes to the focus on closing a deficit; limiting the focus on the obverse, pursuing an opportunity. This is a foundation of policy-making where governance is the description of the characteristics by which society defines and handles its problems (Vob & Kemp, 2006).

Addressing deficits as the motivation of the problem solving approach has included the introduction of different knowledge and values to a problem/policy context through the use of adaptive systems approaches leading to alternative approaches to problem definition (Scoones, et al., 2007). Such approaches introduce complexity of scope, interconnection between factors, and variation in values and interests. The combination of these characteristics makes a case for the introduction of the notion of "dynamic systems", a combination of structure, actors and information to deal with complexity, non-linearity and often non equilibrium (Scoones, et al., 2007) an arena where complexity and uncertainty are linked to reflexivity in problem handling

These principles, along with specialisation in organisational structures as a means to achieving efficiency, combine to result in reductionist policy-making, short term and narrow focus and decisions in regional and local governance. It is argued that these structures need some form of compensating mechanism to ensure the form of governance and policy making reflects the form of the environment within which it operates.

The Condition – Problem Nexus

The problem context is not a simple construct, fundamental to both policy making and policy analysis is "why does a specific condition lead to policy being made, for whose and what benefit and, how is solved defined"? Not all conditions represent "problems" to be solved by policy intervention; "conditions become problems when we decide we should do something about them" (Kingdon, 1995); this observation defines a key point where values (or imperatives) intersect with a condition to define a problem and depending on definition of that problem to commence framing the parameters around which to determine the form of response, the course of action to be taken and outcome that is appropriate. Appropriateness once again is defined by factors including values, relevance, acceptability and benefit, which along with the specific criteria are contextual. This deficit focus precludes the "visionary" perspective, the relationship between political leadership and policy in defining and achieving some "preferred future" that can galvanise society and form the basis for action.

Limits to the Problem Solved Construct

The typical problem-solution construct with its mechanisms and specialist inputs, has long troubled policy writers as a basis for effective public policy design and effectiveness.

Parsons (Parsons, 1995)identifies that the foundations of policy analysis as being laid down by four key writers:

1. Lasswell contributing with an emphasis on closing the gap between knowledge of and in policy making (Lasswell, 1970) and in taking a multi-disciplinary approach to policy development;
2. Simon (Simon, 1976) who followed a similar knowledge link in his "intelligence, design and choice" continuum as a policy making model, identified limits to policy making effectiveness as a consequence of the concept of bounded rationality (and hence of the value of a multi-disciplinary perspective) and policy making being characterised by satisficing, rather than optimising decisions;
3. Lindblom (Lindblom, 1959), in criticism of the rationality implied in the work of Lasswell and Simon, proposed that policy making was an interactive process without beginning or end, resulting in incrementalism as the dominant form of policy response; and fourthly
4. David Easton, who, following the process orientation (Easton, 1979), identified the policy "black box" which took information from the environment and transformed it through this mechanism into policy outputs.

Laswell and Simon, in particular, present a rational decision making construct to policy making. This approach develops from 19th century positivism, a philosophy which is argued by Torgerson to be a model where knowledge replaces politics in policy making (Torgeson, 1986). This occurs as a consequence of increased clarity and certainty arising from knowledge of society applied to society; the construct resulting in the emergence of the technocrat in policy making, as did the industrial revolution herald the dominance of the engineer and scientist and create the pathway for the transition of scientific knowledge into management theory. Laswell and Simon's insights combine the process orientation with three key factors - values, knowledge and power. The positivist perspective was premised on knowledge allowing events to be explained in terms of antecedent conditions and from this, future events could be predicted (Fay 1975), power accruing to those who have the authority to develop the knowledge base and determine how the knowledge is used. The development of knowledge, the interpretation of fact, while presented as "objective", is arguably value laden; in particular where the potential for "rational responses" to be at extreme odds with the reality held by varying policy actors. This thinking appears to emerge in a context of political "normality", an environment in which the legitimacy and authority of government is recognised and acceded to, where government intervention is less pervasive than in contemporary western democracy, where "expert" findings are viewed as valid and where institutions are the sources of advice, opinion and opposition.

Solved for Now

Lindblom's "what is possible" principle (Lindblom, 1959), leads to the notion of constrained policy options within a rational construct; allowing political, fiscal and temporal factors to provide the basis for a constrained or partial response to a policy problem. The inclusion of these parameters facilitates the application of decision support tools, including benefit/cost analysis and its derivations to determine both absolute and relative benefits of policy options.

There are strong parallels between the concepts and models proposed by these public policy thinkers and significant peers in economic policy, in particular Galbraith (Parker, 2005). Economic policy has been an active field of policy making over the past century, defining the clear relationship between values and the variation of macro policy response via the contrast between the individualistic and free market and the community and redistributive economic principles characterising differences in beliefs and values between conservative and socialist policies when in government. Overlaying Galbraith's key observations on the broader policy environment helps frame the context, specifically the application of short run and long run dimensions; the concept of conventional wisdom creating limitations to what can be seen as an acceptable decision and its link to "satisficing" decisions (Simon, 1976), the benefit/cost of symmetry between social and economic outcomes and the identification of linkages between the elements of production creating a system which must be understood if decisions are to approach optimality. Lindblom's "science of muddling through" (1959) is provided with a supporting context when linked with the notion of "what is possible" (at this point in time and in this context) and consequent concept of incrementalism, small changes often as opposed to the significant step change; highlighting the direct relationship between what is possible as a

policy and intervention framework and the limits of understanding in conjunction with conventional wisdom.

Within the concepts and frameworks noted above, the emerging policy analysis context and in challenge to Lindblom's incrementalism approach (Dror, 1964), Dror proposed a modified form of rationalism (Dror, 1970) drawing from systems analysis, policy analysis and behavioural sciences to frame a scientific approach. Dror later (1989) reflected on the deficiency of policy analysis to address the developing world; this perception highlights the critical nature of the variation in societal context between the developed and developing world and potentially the focus of policy between solving problems as opposed to major shifts in paradigm; challenges such as human induced climate change also highlights that the challenge in proposing big, or systemic solutions are not confined to the developing world.

Policy Evolving

Kingdon (Kingdon, 1995), reflecting the ideas of Lindblom (Lindblom, 1959) and Easton (Easton, 1979) defined policy making process as a primeval soup, one comprising ideas, players and incentives etc – "This policy primeval soup does not closely resemble a rational decision-making system with a few well-defined alternatives, among which the decision makers choose. The process is evolutionary, "a selection process within which some ideas survive and flourish" (Kingdon, 1995) and characterised by mutation and recombination of ideas and proposals, in particular the notion "the idea's time had come", the convergence of the policy and political windows. Convergence of ideas and the policy opportunity through networks, communities forming sub-systems within the policy system (Richardson & Jordan, 1979) (Rhodes, 1985) demonstrates the potential for redefining contexts, problems, responses, combining interests to further evolve responses and linking issues to dominant agenda themes.

Chaos, Realism and Opportunity

These writers lead to the conclusion that problems and challenges are rarely neatly ordered. A fundamental policy challenge is the representation of what appears "chaotic" in a form that supports the description of a policy problem. This includes layers and connections of information, values, actors and interests in a form that facilitate and mitigate against problem definition and policy design, implementation and evaluation. Representing key elements of the problem/policy context – condition, connections, relationships and interdependencies– in a form that enables representation, understanding and explanation of these dimensions and interdependencies is arguably central to transformation of chaos into a form that enables issues to be addressed through policy options, including options that represent a phase in moving to an "end game. Consistent with this representation is a focus on the transition from highly simplified theories and models towards more reflective, complex and realistic models which in turn recognizes complexity in the way in which policy and strategy is articulated, designed, implemented, evaluated and adapted. An increased focus on outcomes as a "lagged consequence" of policy/strategy driven changes to outputs provides the opportunity create a complementary representation, narrative and analysis of complexity that people can engage with (Batie, 2008).

The recognition that not all challenges allow for a definitive solution is well expressed in the notion of "problem handling" as opposed to the "problem solving". This leads to incremental approaches to managing uncertainty in terms of problem definition (Rittel & Webber, 1973) exploring predictive cause/effect relationships and progression towards a desired outcome, developing a focus on thinking to learn our way to purposeful action such that the situation improving (Hoppe, 2018). Such an approach also allows uncertainty of both outcome and unintended consequences to be recognised, considered and addressed within policy design, implementation and evaluation (Holden, 2005) (Walker et al 2001). Some uncertainty arises from unknowns in factors that influence the current condition, the scope and dimension of effects arising from intervention; these factors give rise to the conclusion that the dimensions of a problem may be wider and deeper than initially concluded; this gives rise to the option that the observed condition, causalities effects may be part of a broader set of factors that work as a system.

Kingdon's observations highlight that the notion of rational decision making, chaos and opportunism are not mutually exclusive and are likely to occur in sequence and parallel in determining both a problem, converging and redefining problems and in designing policy responses. In a sense the formal, informal and opportunistic networks are observable manifestations of the systems that are represented in policy making, in effect demonstrating the multi-disciplinary (and as such perspective) approach identified by Laswell as necessary to close the gap between knowledge and policy (Lasswell, 1970).

Wicked Problems

The twin challenges uncertainty in problem definition (Hoppe, 2018) and the capacity to design a solution to policy problems to achieve the "problem solved" result is long recognized.

The term "wicked problem" (Rittel & Webber, 1973) was developed as the basis for comparison between tame and wicked problems as a means of differentiating between, easily solvable and those where the characteristics reflect a complexity that ensures the policy outcomes are achieved through a series of incremental improvements designed within a recursive process, rather than in a discrete event. The increasing scope and depth of problems as the role of government expands, access to full knowledge and contests for resource allocation (Lasswell, 1970) create a policy making environment where incrementalism remains a dominant form of policy decision making (Bendor, 2015). A further dimension of this is the goal of moving the policy arena from an unstructured environment towards one that becomes increasingly structured or tame (Hoppe, 2018). This introduces the concept of learning and confidence in how to approach the problem, even if the outcome is incremental or experimental (Hoppe, 2018) (Ostrom, 1999) and the proposition that the problem is "wicked" as a result of the limits of the heuristics that are applied to the problem conditions.

Comparative analysis of the differences between tame and wicked problems brings into play many of the complexities and dynamics that combine to create the policy making context and the causality of the likely variation in policy outcome.

The "problem identified - problem solved" public policy model is a metaphor reflective of the notion of rational, linear public policy making and means of acquiring political capital; while having proven a valuable analytical construct, problem solving is rarely achieved in the practical policy arena. The model is reflective of the tame problem – a condition where there is a clear and agreed definition of the problem, the approach to resolution, agreement on the desired resolution and the ability to define when it is reached; this is a form of problem with contextual characteristics opposite to that of the wicked problem defined by Rittel and Webber.

What is a "wicked problem" and why is it a useful frame within which to consider policy analysis and policy making? The characteristics of the wicked problem are elaborated against four criteria:

Table 2.1 The Characteristics of a Wicked problem

Criteria	Characteristic
The problem	No agreement exists about what the problem is. Each attempt to Create a solution changes the problem
	The solution is not true or false (right or wrong) – the end is assessed as "better" or "worse" or "good enough"
The role of the stakeholders	The "problem" changes over time
	Many stakeholders are likely to have differing ideas about what the real problem is and what its causes are
The "stopping" rule	The end is accompanied by stakeholders, political forces and resource availability. There is no definitive solution.
The nature of the problem	Solution(s) to problems is (are) based on judgements of multiple stakeholders
	The problem is associated with high uncertainty as to system components and outcomes
	There are not shared values as to societal goals

Source: Batie (2008)

The defining characteristics of a wicked problem reinforce the contemporaneous relevance the inclusion of terms such as values, stakeholders, problem definition, judgement and uncertainty within the characteristics. The characteristics are reflective of the increasingly connected nature of people; interest groups and interests; the willingness and means to express different values and views; the understanding of the connections within and between ecological, economic and social systems and the contested nature of policy.

Batie (Batie, 2008) identifies that wicked problems are pervasive and challenges the adequacy of normal science and approaches in addressing the complexities of wicked problems in a policy context while contending that post normal science, including social

sciences remain crucial for the development of alternative policies. Batie's comments reinforce the logic of developing alternate heuristics to match the realities of the policy environment.

Adaptiveness - Dynamics

This challenging shortcoming in governance has been recognised and addressed in many ways. Adaptive governance, and matrix organisation, along with incremental and process-based approaches to problem solving are examples of responses. These tend to provide an organising and/or process approach to problem solving and policy making, the way these occur defines the problem, identifies who is involved in the solution and the process necessary to get to a changed state.

The fundamental determinant of the wicked problem is complexity, a function of the "connected, dynamic and contested" context within which the problem is determined. Both problems and the policy solution redefine over time and in response to new signals, the dynamics are not linear, creating a problem arena where issues are mutually implicated, the problem extends over many scale levels, space and time and by their nature involve uncertainty and a plurality of legitimate perspectives and by their nature involve deep uncertainties (Funtowicz & Ravitz, 2002). This wicked problem construct does not match the political capital acquisition process which has developed over the past 70 years based on problem/crisis resolution and yet is sought to be accommodated within it to match societal expectations.

The above writers highlight an identified mismatch between the formulaic, complicated problem solving techniques applied to public policy development and the reality of the context within which the policy development occurs, and it is supposed to deliver value. The duality of both of the policy output and the mechanism for its development to each match the context that they sit within to deliver societal outcomes is considered key and far-reaching in relation to governing principles, mechanisms and structures. Until this point the literature describes the deficit between the policy making process in terms of match to the real world, the discussion from this point is developed in relation to alternatives, the potential to complement and also disrupt a practice that arguably forces much policy development into a process and supporting it with tools that are not necessarily "fit for purpose". The consequences of which are poor policy, poor resource allocation and productivity and the diminishment of capitals and their potential.

The recognition of, consideration and perceptions of complexity are considered the foundations for these alternates and disruptions, within the progression of policy development evolving from an event, to a process that enables adaption towards an intervention in a dynamic system.

The policy context is often complex, rather than complicated

The consequence of the problem solving and scientific approach starting point to policy development is arguably the consideration of policy predominantly as a complicated, management science used to address competing problems. Rather than a single, dominant policy making process, different conceptions of the policy making processes, the rational, linear or circular sequences; ongoing, incremental, satisficing approaches; and the chaotic, opportunistic promotion of melding of ideas can be represented as the dominant model at different times within the policy agenda and decision making process.

While policy making does include these subsidiary elements in terms of solving specific operational problems and achieving efficiency it is further argued that at a policy level the context is complex, rather than complicated and requires a matching approach to its making.

Simple, Complicated, or Complex?

Management thinking also provides an opening to introduce the approaches of policy writers through the categorisation of systems as simple, complicated or complex. Rijke et al (Rijke, et al., 2012)address the importance of recognising which elements of the situation are able to be classified as simple, complicated or complex and responding to them in a manner that reflects this classification. Complicated systems are identified as adhering to a "comprehensive and robust set of axioms and rules" enabling them to be generally managed with proper models and expertise (Rijke, et al., 2012). Intricacy and scale are typical sources of complication.

Complex systems are generally defined as "being composed of a large number of active elements, whose rich patterns of interactions produce emergent properties that are not easy to predict by analysing the separate parts of the system" (Ostrom, 1999); these systems sharing basic properties of non-linearity, flows, diversity and an aggregation that generates larger scale, complex behaviour from the interactions of less complex agents. Rijke notes that complex systems do not lend themselves to a solution, requiring a more nuanced, "manage not solve" approach (Rijke, et al., 2012) and that rigid, rules based approaches, successful in complicated systems will not work well in complex systems environments. This supports the extension of approach to policy as experimentation (Ostrom, 1999) and following the complicated versus complex discussion from the use of a formula to the use of a heuristic for consolidating signals, ordering, representing and understanding information on which to make and explain decisions.

If policy development conforms to the taxonomy above, there will be some dimensions of it which are simple or complicated, in particular at the point where policy is translated into practice. Policy making in general is complex, this complexity is enhanced by:

- Connections – society, its communities and individuals are socially and economically connected in both physically, transactionally and in terms of information transfer

creating both interdependencies and based on the interpretation of and response to signals a propensity activate change;

- The activation creates cause/effect dynamics both as easily perceived shocks and incremental trends creating patterns of thinking and change that propagate through these multi-layered and multi-perspective connections with differing velocities (and therefore timing) and intensities;
- Differing values, preferences and priorities ensures that the consequence of these dynamics is the establishment of tension between differing ideas and arising actions leading to contests which also exhibit varying intensities and velocities.

Failure to understand the characteristics and nature of the policy environment prior to applying tools better designed to manage complicated means that the policy development process is unsatisfactory for all involved in and impacted by the system.

Variation between and the dynamics of, people's values, interests and their perception of reality, can be argued as the commencement point for both contestability and cooperation, and where behaviour may switch from one to the other (Ostrom, 1999); factors leading to expression of legitimate, disparate views, determination of whether a problem exists or whether there is an agreed, correct definition of the problem (Horn & Weber 2007). The inherently iterative and reflexive nature of dealing with such problems can result in base definition changing over time, arguably through discourse, deliberation, influence and/or macro changes in community values. Within this dynamic value ridden, political and uncertain environment, the rational or normal role of science and experts is challenged in terms of both adequacy and legitimacy (Batie, 2008).

Complex Systems

The introduction of complexity provides for a transition from linear thinking dominance to one of considering patterns as a means of understanding the context for and the form of, a challenge or opportunity (Arthur, 2013). The focus on patterns has emerged as "systems analysis" and "systems thinking" around the pattern of organisation of elements (Capra, 1996), which in conjunction with the associated interrelationships and response to feed-back from and between the elements of the system, the non-linear nature of the dynamics (CAPRA, 2002) leads to the term "complex adaptive systems" (CAS). Underpinning the descriptive, analytical and predictive potential of this form of system is the application and integration of quantitative and qualitative information and modelling techniques.

The above crystallises the complexity of policy making, highlighting contemporary challenges in making the decision to intervene (or not) and subsequently designing a policy intervention in the face of competing interests and finite resources. Overarching this challenge and the context that combines actors, interests, values and process is the concept of sustainable development; a multi-dimensional and dynamic concept which has fundamental implications for the governance of modern society (Rammel et al 2003) and as identified by Vob & Kemp (2006), its attendant social, economic and ecological systemic and long term dimensions bring complexity and uncertainty to the fore, highlighting the needs for new forms of problem

handling. Vob and Kemp argue that sustainable development is a functional condition; "a process that can be sustained over time without eroding its foundations"; while framed in the context of development, the systemic and temporal concept can be applied to policy development across many arenas and contexts.

The concept of "problem handling" as opposed to the "problem solved" approach identified by Hope (above) is considered consistent with incrementalism and uncertainty. This supports the concept of progression towards a desired outcome; thinking as the means to learn our way to purposeful action that is situation improving (Ison 2004). Uncertainty of causality, outcome and unintended consequences are factors to be recognised, considered and addressed within policy design, implementation and evaluation; ignorance and uncertainty are effectively dealt with rather than ignored (Walker & Avant, 1995) within structures that are adaptive and allow for error and learning. The three perspectives in the development framework – social, economic and ecological, support the consideration of policy from independent and interdependent perspectives and in so doing combining differing knowledge and value frames within a complex and uncertain policy environment in a manner that introduces interaction between different rationalities. Ostrom's notions of a system of building blocks, their dissembling and reassembling to define new relationships, knowledge and innovation (Ostrom, 1999) is inherent within this reflexivity and incrementalism.

This interaction promotes reflexivity, bringing up new knowledge; integrated knowledge that transcends boundaries between disciplines and between science and society (Vob & Kemp, 2006)and addresses the interaction between heterogeneous elements and how they are coupled. It is further concluded by Vob and Kemp that by exposing different actors they begin to mutually adapt their perceptions, criteria and strategies; continued learning in the course of modulating that also shifts policy objectives through systems analysis and synthesis which seeks to reveal different and at times conflicting perspectives that prepare the ground for mutual understanding (Scoones, et al., 2007).

This quasi-rationalist conclusion facilitates consideration of problems and policy with a multi-level (global, regional and local) and multi-dimensional (policy issues and interrelationships) structure of nested sub-systems, their actors, networks and values; a place where actors follow their own vital interests partly in cooperation and partly in conflict (Vob & Kemp, 2006) and where there may be different rates of change in different sub systems (Scoones, et al., 2007). The systems and sub-systems architecture provide the means of considering key factors, patterns and connections within an otherwise chaotic environment; a form of reductionism within a broader systemic framework. Arguably, the recognition of the wicked problem is the starting point to consider how to apply many of the approaches, models and tools within different frames and approaches.

System thinking and structures provide a means of considering key factors, patterns and connections within an otherwise chaotic environment. They provide approaches that assist in addressing dynamics and non-equilibrium situations, as well as the contested nature of problems. Such concepts, theories and practices provide the foundation to deal with

complexity arising from the interdependent, interconnected nature of place and interests associated with that place.

These concepts of complexity of scope, interconnection, values and interests combined with reflexivity and problem handling provide for the introduction of the notion of dynamic systems; a combination of architecture, actors and information characterised by complexity, non-linearity and often non equilibrium (Scoones, et al., 2007) an arena where complexity and uncertainty is the norm, not the exception. A fundamental challenge is the representation of what is "chaotic" in a form that supports the description of a policy problem and its layers of information, values, actors and interests in a form that facilitates problem definition and policy design, implementation and evaluation within this reflexive frame, a challenge of systems architecture. Architecture in this sense means of identifying and mapping key elements of the problem/policy context – condition, connections, relationships as a basic map enabling description of these dimensions within an overlay of the influence of actors and power.

Easton proposed an inputs/outputs concept (Easton, 1979) where environmental inputs and policy outputs were connected through the policy process designed to achieve some beneficial result in the issues environment or problem arena. An alternative to considering the progression of inputs/outputs as steps in a process is to extend the proposition and consider inputs, outputs, outcomes and impact as different but interrelated temporal and scope perspectives on which specific actors in the policy process have as their primary interest and focus.

The systems model construct draws significantly from life sciences and ecology. These disciplines have long experience in thinking in such frames, with notions of non-equilibrium and self-organisation, in particular with the observation that "no one external designer or manipulation from some centralised source of control directs these new patterns" (Cilliers, 1998). Small changes in some elements of an active system can alter the long term behaviour of the system (Holden, 2005), yet the robust nature of complex systems is their capacity to perform in the same way under different conditions, ensuring survival (Cilliers, 1998). Holden provides a valuable definition of a complex system applicable to public policy analysis:

> *A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents. Examples include the immune system, a colony of termites, the financial market, and just about any collection of humans …..* (Holden, 2005, p. 651)

The policy antecedent of a complex system is the presence of a significant number of agents able to interact and the adaptation that arises as a consequence of that interaction (Holden, 2005). To this end Cilliers (Cilliers, 1998) offers the following characteristics of a complex adaptive system:

- A large number of elements interact in a dynamic way with much exchange of information;

- These interactions are rich, non-linear, and have limited range because there is no overarching framework that controls the flow of information;
- Complex systems are open systems with feed-back loops, both enhancing and stimulating (positive), or detracting, inhibiting (negative) where both kinds of feedback are necessary;
- Complex adaptive systems operate under conditions far from equilibrium, which means there is continual change and response to the constant flow of energy into the system;
- Complex systems are embedded in the context of their own histories, and no single element or agent can know, comprehend or predict actions and effects that are operating in the system as a whole;
- Complexity in the system is a result of the patterns of interactions between the elements.

Cillier's characteristics are particularly pertinent to current societal characteristics, in particular:

- The internet and social media provide a means for like-minded people to interact at many levels, co-location is unnecessary, there is no meaningful time lag between event and receipt of communication;
- The use of the web as a means of publishing, consolidating and accessing communication has resulted in contemporary and wide ranging knowledge, discussion and interpretation is available to many, diminishing the "positioning of experts" as the primary source of specialist technical information, interpretation and the framer of narratives on which decisions are made – people from "outside the system" can now engage in decision forming activity;
- As a consequence of knowledge and organisation people from outside the system challenge the appropriateness of decisions within the context of their values and as part of this the legitimacy of the systems institutions and agents.

These characteristics and influences are considered well matched to the policy environment as summarized in the following table. The table categorises the complex system characteristics within the three key meta environment parameters – ""connected, dynamic and contested"" that form the foundations of this thesis.

Table 2.2. The Characteristics of Complex Systems

Complex System Characteristics
Connected
• **A large number of elements interact in a dynamic way with much exchange of information;**
• **These interactions are rich, non-linear, and have limited range because there is no overarching framework that controls the flow of information;**
• **Complex systems are open systems with feed-back loops, both enhancing and stimulating (positive), or detracting, inhibiting (negative) where both kinds of feedback are necessary;**
• **Complexity in the system is a result of the patterns of interactions between the elements.**
Dynamic
• **A large number of elements interact in a dynamic way with much exchange of information;**
• **Complex adaptive systems operate under conditions far from equilibrium, which means there is continual change and response to the constant flow of energy into the system**.
Contested
• **Complex systems are embedded in the context of their own histories, and no single element or agent can know, comprehend or predict actions and effects that are operating in the system as a whole**.

Table 2.2 provides a foundation for the way in which public policy challenges within the regional/local arena could utilise complex system frameworks.

While Cilliers has moved beyond the eco-system metaphor where the complex adaptive systems construct draws significantly from life sciences and ecology and complementary frames of complexity science, the reinforcement of the use of reason and persuasion in effort to devise better rules (Ostrom, 1999) through utilisation of individual judgement or mechanisms including deferring to those with formal or informal authority, majority voting or relying on unanimity, factors influence by culture, traditions and practice that add layers of complexity, is not explicitly highlighted within the identified characteristics. The inclusion of these factors as determinants of system direction and operations highlights the socio-technical construct of any representation of a complex policy system.

The challenge is to transition from these perspectives and dimensions into a system architecture that is more defined than the "black box" characterisation made by Easton (1979). A form that integrates the thinking frames identified above and provides" a meta model that enables the description and visualisation of a policy environment, engagement of stakeholders and the development, implementation and evaluation of policy in a manner reflective and understanding of its context.

From Funtowicz & Ravitz and their perspectives of governance under conditions of complexity, the concept of systems is identified as important(Funtowicz & Ravitz, 2002, p. 16); "*First, we think of a "system", a collection of elements and subsystem, defined by their relationship in some form of hierarchy or hierarchies. The hierarchy may be one of inclusion and scale.....or it may*

be a hierarchy of function.....may also include human and institutional subsystems....". This combined excerpt provides some concept of what a system can be, separately and jointly; importantly such models can provide a representation of the reality that provides a picture of the scope and dynamics of the policy context.

System and reductionist approaches are also considered highly complementary. Elements of an eco-system do not all respond to the same change signal, nor at the same rate; some do not respond, the response to change is not universal. An understanding of the building blocks and internal models (Ostrom, 1999) that frame how society works and their potential for dissembling and resembling to create new options and innovation, also allows a specific block to be "removed" from the system for analysis and prior to final decision, replaced into the system to evaluate how the decision may further propagate through the system. This introduces cause and effect into socio-technical perspectives and in time dimensions, provides for simultaneous consideration of acute and chronic issues. This unique capacity of systems approaches enables the understanding of complexity as the basis to alter the policy stance from adaptive to dynamic, an active form of response based on the reasoning capacity that differentiates the social system from the biological. The role of stimulatory policy, at the macro level performing specific catalytic roles, or at the local level creating incentives are relatively common and focused on specific dynamics that demonstrate policy intervention as a longstanding, dynamic, goal-oriented tool rather than one that supports adaptation. These stimulatory policies provide both tangible impact and send signals that propagate through society, designed to stimulate behavioural change. These nudges, build on the potential to stimulate changes within group and individual norms and in addressing the constraints of "bounded rationality" (Lodge & Wegrich, 2016)to act as a catalyst for innovation.

The transition from the current policy development models to some form of CAS or dynamic systems model, is informed by thinking models that have merged to capture the concepts of connectedness, in particular between perspectives.

Complexity thinking and engagement models

The policy and management communities have an active role in developing thinking models to address limitations to the reductionist, linear frames identified above and in-line with the concepts identified by the writers cited and many others. In considering the principles that could be embedded in some form of representation of a complex adaptive system, the following resonate as contributors bridging theory to practice.

It is recognised that the challenge of dealing with complexity is multi-disciplinary. The concepts and approaches summarised below are limited to a cross-section of those which have and continue to impact public policy practice and thinking in relation to place-development. Largely, these approaches while recognised as important and valid, remain unresolved and challenging to public policy making.

Socio-technical Systems

The term "socio-technical systems" was originally coined by Emery and Trist (Emery & Trist, 1960) to describe systems that involve a complex interaction between humans, machines and the environmental aspects of the work system. This concept has extended into community and societal theory and the resultant quality of life concepts identified as the basis for policy development in terms of both the consideration of behavioural perspectives and inclusive process.

As with the industrial application, extension into the societal application leads to consideration of people, the way they function as a society and the knowledge and practices that support this as a policy resource. Again, as with the industrial model, harnessing this resource capacity to achieve a productive policy outcome is challenging.

The recognition of the role of a community, beyond that of the ballot box, is a significant contributor to the complicated to complex differentiator. This in addition to the questioning of the status of policy and advice that is rational and objective on the basis of "whose rationality and objectivity?"

The dynamic, interconnected and contested proposition underpinning this thesis is derived from the recognition of the policy context as a socio-technical system founded on the culture, capitals and expectations of a society/community.

Community Capitals

Putnam's social capital construct (Putnam, 1993) and extension into the community capitals framework (Emery & Flora, 2006) categorises the mix of tangible and intangible capitals on societies in places are founded and operate, offering a structure on which to identify and consider potential policy interventions. This enables consideration and analysis of the assets in each capital (stock), the utilisation and interaction among the capitals and development of capital(flow) as a descriptor and capacity of a place, its future potential and as contributors to livelihoods (Scoones, 2009). The scope of capitals generally included focuses on seven different components of community capital.

The "community capitals" construct (Emery & Flora, 2006) informs the assessment of condition at the micro and meso levels, in conjunction with the physical inputs and outputs as a taxonomy on which to frame and consider regional capacity and success, in particular the consideration of absolute and relative stocks and flows of these capitals as defined below.

- **Natural capital:** the natural resources and amenities in a particular location "including weather geographic isolation, natural resources, amenities and natural beauty", shaping the cultural capital connected to place.
- **Cultural capital:** the way people 'know the world' and how they act within it, including language and traditions. "Cultural capital influences what voices are heard and listened to, which voices have influence in what areas, and how creativity, innovation and influence emerge and are nurtured".

- **Human capital:** "the skills and abilities of people to enhance their resources, access outside resources and bodies of knowledge to increase understanding, identify promising practices, and to access data for community-building", as well as leaders' ability to lead across community differences, to focus on assets and be inclusive and participative to proactively shape community development.
- **Social capital:** the connections among people and organizations or the social "glue" to make things, positive or negative, happen, this includes entrepreneurial social capital that drives development through both internal and external networks.
- **Political capital:** access to power, institutions, resources and power brokers and "the ability of people to find their own voice and to engage in actions that contribute to the well-being of their community".
- **Financial capital:** access to the financial resources necessary for development and "to accumulate wealth for future community development".
- **Built capital:** physical infrastructure that supports activity at the micro level.

This construct provides a means of expanding the meaning of socio-technical into elements that can be used to consider stock and flow of capacity and can also be utilised as the focus for policy and strategy intervention. An important dimension of the community capitals definition is the interdependency between them and the various lagged relationships. For example, investment in built capital may have an immediate impact, where a similar investment in human or social capital may be relatively lagged; this allows for policy interventions which make quite different contributions in the short term, but in the medium to longer term will combine to achieve a specific outcome.

Program Logic

Logic models were initially introduced into the policy field in the mid 1990s, coming to prominence in the early 2000's as a model to support design, planning, communication, evaluation and learning.

> *Program logic is a schematic representation that describes how a program is intended to work by linking activities with outputs, intermediate impacts and longer term outcomes. Program logic aims to show the intended causal links for a program.* (Centre for Epidemiology and Evidence, 2017, p. 4)

The approach provides a graphic means of organising thinking, displaying ideas helping describe and develop understanding of relationships. The connection between resources and results is explicit. The fundamental sequencing is resources, activities, outputs, outcomes (short & medium term) and impact.

Effectively a linear logic, the models tend to describe a bounded project or initiative; what is planned and expected.

The program logic sequencing is considered critically important, particularly if considered in conjunction with the community capitals framework; in particular in:

- its specific contribution to improving the focus on outcomes; and
- providing a potential to link capitals application and development to activity intervention of improvement.

As demonstrated in the above citation, program logic is well established in government, in particular as a frame for program design, implementation and evaluation within fields such as health, education and increasingly regional development. While the logic progression is utilised, the structure has not migrated or adapted to becoming the norm as a broader policy framework.

The Triple Bottom Line

The triple bottom line, as articulated by John Elkington (Elkington, 1997) is based on the premise that sustainability requires all activity and business widen its concept of a "bottom line" to include environmental (ecological), financial (economic) and social factors.

The concept is employed in two quite different ways:

- First, it proposes management to optimise the three bottom lines.
- The second use of the triple bottom line suggests that an organisation should be accountable for its financial, social and environmental performances.

The concept is widely endorsed and has been followed by many iterations and variants. Included in many plans and reports but in reality, the concept is often poorly implemented; captured and diluted by accountants and reporting consultants (Elkington, 2018). Originally proposed with a goal of system change, it was never proposed as an accounting system but as a sustainability framework.

In practice, the interrelationship between the perspectives is not always evident or translated into interdependencies in the manner in which, for example economic factors contribute to environmental performance, the notion of balance or conjoint achievement is not necessarily evident in implementation. The use of monetary value as the measure across the mix raises challenges in capturing the true value of each of the perspectives and achieving balance between them; again, leading to the critical question of how value is measured (TIPPINS, 2012), and whose values are represented. Never the less it provides the basis for inclusion of multiple perspectives and the concept of balance between them. Within the meta-framework approach included within this thesis, the triple bottom line elements are transformed from a bottom line residual, to actively sought outcomes.

The Balanced Scorecard

Kaplan and Norton introduced the "balanced scorecard" in 1996 (Kaplan & Norton, 1996) and achieved almost instantaneous success and uptake as a management tool. Including the connected thinking that underpinned the triple bottom line, the scorecard was premised on measuring performance and transparently reporting on finance, market, internal process and learning & growth in an organisational context and in particular the balance and interdependency of the relationships. In essence it created a program logic type progression from learning and growth upwards through internal process, market performance to financial results. This clearly introduced human capital as a key transformative input and the recognition of lags between intervention and financial outcomes.

This enabled Kaplan and Norton to extend this reporting and associated visualisation techniques to design the "strategy map" (Kaplan & Norton, 2000), a visualisation of these four perspectives with their constituent key measures and indicators. The strategy map placed the four perspectives in a lead and lag construct, vertically arranged from finance at the top with market, internal process and learning & growth descending from this. The rationale being that achievement of a certain financial outcome required a specific market result derived from internal process that performs as a consequence of a learning and growth initiative. This planning sequence has a corollary in the reporting, if the financial performance does not match expectations, what is not being achieved in the market, what within the internal process is in deficit and what learning and growth needs to occur to close the deficit.

To this point, the logic identified above matches program logic, what sets the Kaplan and Norton strategy map apart is the inclusion of the constituent elements within the perspectives and the capacity to identify multiple causality and patterns – a significant break from linear thinking models. Proprietal business intelligence software packages supported the use of the strategy map as both a planning and reporting tool, including the use of scenario modelling based on understanding the relationships between the elements within each of the perspectives and those within the perspective above. Colour coding of the results was based on a combination of weighting and the variation around the specific target for the element; as was the performance of the perspective overall.

The system, represented by the strategy map, could be "shocked" by external factors to visualise how the exogenous change would propagate through the system.

Inherent in this is the adequacy of the policy narrative and discourse and its capacity to resonate in the contests that exist within the societal contest. The notions of multiple perspectives and the value of capitals development within organisations has strong parallels with thinking frames applied to development, particularly in third world places.

Livelihoods

The livelihoods perspectives can be thought of as a convergence two longstanding principles relating to the role of policy in affecting people's quality of life (Torgeson, 1986) and the means by which different people in different places gain a living (Chambers, 1995). This convergence introduces the nexus of culture and context as key sources of diversity that provides a challenge to single sector or single perspective approaches to solving complex (rural development) problems. While the approach has a specific focus on the rural context, it introduces the notion of sustainability, a longitudinal dimension to create multi-perspective connections and principles that are arguably transferable to other policy arenas. This conclusion is reinforced by the following definition:

> *A livelihood comprises the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its*

capabilities and assets, while not undermine its natural resource base (Chambers & Conway, 1992, p. 6)

The livelihoods approach received significant criticism (Scoones, 2009), primarily related to:

- Being viewed as too complex and so not compatible with real-life situations and decision making processes, which were more focused on macro dimensions;
- Lacking attention on politics and power, including practice that failed to make such connections; and
- Lack of focus on and capacity to deal with long term and major shifts, shocks and mega-trends.

The approach was people centred, and importantly connected community capitals (Emery & Flora, 2006) to activity that generated the means of gaining a living. While tending to be applied at a very local and immediate level and subject to a range of criticisms (Scoones, 2009), the approach and the multiple perspective, diversity and complexity themes it identifies resonate with other policy arenas in a contemporary sense.

The Scoone conclusions indicate the critical importance of defining the scope of a "system" and the capacity to recognise and respond to endogenous/exogenous factors that define the interdependencies and their scale/temporal relevance. It also highlights the inability of the policy development institutions and processes to accommodate this alternate perspective a contradiction to much thought around adjusting the policy development framework to match the real world.

This highlights the tension between traditional policy approaches and alternate approaches, which question factors such as institutional culture, structures, decision models and the traditional variables that impact thinking. Addressing this is central to the introduction and utilisation of alternates and demonstrated in "complexity economics".

Complexity Economics

Complexity economics provides a new framework for thinking about the economy, one that emphasises the processes of change and creation, rather than the physics of goods and services within an economy that permanently open to responses and new behaviour; in a permanent state of non-equilibrium (Arthur, 2013).

Arthur argues that considering the economy as one always in motion, perpetually computing itself and reconstructing based on recursive basis where behaviours react to patterns they together create, this recursive loop creating a link to complexity. This reinforces the importance of understanding the interconnected behaviour, dynamics and therefore of understanding what drives the dynamics and emergent patterns; placing the technologies and other innovation to the forefront of analysis and prices/quantities into the background.

In this construct the economy is a set of arrangements by which society meets its needs, an expression of how it applies and develops its capitals to achieve outcomes. This reinforces the importance of the meso dimension of the economy and by default connects capitals to

activities. The shift highlights a rebalancing of economic thought from allocation to formation of an economy, and from a dynamics perspective, how innovation creates new formative patterns leading to structural change over time.

The recognition of complexity draws in consideration of culture, tangible and intangible change, institutions and other capitals into the economic system.

The analytical consequence of this thinking is the transition from equations to algorithms as the means of gaining deep understanding of the mechanisms that create these patterns and the propagation of change. This introduces the potential for economic analysis to from a narrative that is recognisable as relevant and to facilitate wider engagement in the discourse of economics as part of the system and a key outcome in balance with other perspectives.

Social License to Operate

The monopoly of government(s) as the arbiter of appropriate policy and regulation is arguably challenged within western democracies. In particular within projects and policies that use commonly owned natural resources and space, government now competes with increasingly organised interests that are connected and organised on local, national and transnational scales. Arguably government has not succeeded in creating a trusted, legitimate narrative that validates their role as a delegated, legitimate decision maker on behalf of society. A further source of this discontent is the perception of policy as a legacy, yesterday's answers to today's problems in terms of both the "policy" and the authoritative means in which it is determined. (Hoppe, 2018)

In response to these factors, two components emerge, the rise of local groups and the role of interests that present as agents across locations, the two at times coalescing to increase media attention on new activities and reflect growing societal expectations and pressure on industry to obtain and maintain social license (Van Puten, et al., 2018).

A key challenge is that unlike formalised structures, social license has no easily definable parameters and is framed in the values of those who are inclined to contest the policy and project propositions. This is not to invalidate concerns, however the existence of the concept and its ability to influence is recognised as part of the dynamics that affect both policy process and outcomes. The contests are potential signals within the system of emerging changes in values and priorities and as highlighted above by Arthur, the positive feed-back from action itself can lead to further activation of the mechanisms multiplying the change.

Proponents of contest and associated agents are highly skilled in establishing narratives that resonate in a form that formal policy makers are challenged to match. Reinforcing the socio-technical positioning, policy narratives are essential not just in presenting a story, but over time in establishing trust and legitimacy.

Policy Connections, Dynamics and Discourse

The ability to represent and explain a policy context in a form that resonates with those affected and those who contest is an important component of policy development in the

determinants of context emerging from the above literature. The introduction of different values, information and knowledge leads to different narratives and different problem definition (Scoones, et al., 2007). Narratives and discourse provide a foundation to policy making where governance is the description of the characteristics by which society defines and handles its problems (Vob & Kemp, 2006). Consideration of the confluence of factors, values and narratives is fundamental to addressing inadequate problem construction leading to unintended consequences (Scoones, et al., 2007).

The complexity, pluralism and duration of the policy cycle creates a significant weight on the narrative surrounding the issue. Discourse analysis provides a way of thinking about the policy evolution in a wicked problem context; one that is not solely centred on institutions, structures and procedures, but is more also focused on interrelations and connections and following Foucault's traditions, on power and social practices that shape discourses (Hewitt, 2009).

The development of a narrative that is received and interpreted as both relevant and motivating to individuals, communities and interests/agents to respond/accept is a practice that requires both a frame and content. Program logic provides a framework within which to structure content, a logical linear progression that can clarify cause/effect or the effect of not acting. Without such structures and openness of both deliverer and receiver to acceptance of the logic, content and legitimacy, the ability to achieve a mature discourse is challenged.

Each of the above innovations make a strong contribution to assist in considering the aspects of connections, dynamics and complexity as real world challenges, and while demonstrating some success or momentum, their ability to gain traction by meaningful mainstream utilisation has been limited or almost stalled. Elkington and Scoones recognise the challenges in relation to barriers, and the potential for capture and/or rejection of the whole because some elements are under-developed (Elkington, 2018) (Scoones, 2009). It is contended that these innovations and inclusive governance models "need a home" a place where they can be used as specific approaches and in complementary ways; the remainder of this thesis if focused on the design and application of a meta-framework that utilises a dynamic systems logic as that home.

A meta-framework approach to representing and utilising complexity

Complexity is largely considered as "something to deal with"; alternatively, it is it is argued that being able to represent and understand complexity creates opportunity for innovation through new connections, ideas, collaboration and intervention design.

The thinking frames above indicate that while the terms are often quickly adopted, the transition to meaningful application and effective practice is more challenging. While program logic provides a linear, schematic representation, there is a perceived literature gap in achieving the same form of schematic representation for a complex adaptive system. The meta-framework proposed within this thesis is offered as a means of providing a CAS heuristic

and as a structure within which to operationalize the CAS thinking as a means of utilising principles and tools such as described above and develop new approaches to in designing policy and strategy that better utilizes value inherent in the complexity of the real world policy and development environment.

The notion of "Complex Adaptive Systems" is recognised as a useful framework for considering the evolution of change across systems generally, however representing and utilising the concept as a reflection of reality in specific domains remains undeveloped. This section attempts to translate the previously identified theory, issues identified and practice into a meaningful general representation of the policy environment as a means to apply it to a range of contexts.

The approach facilitates a transition from linear structures to a two dimensional form. Inherent in this is the Ostrom concept of utilising "building blocks", on which to design a meta-framework that includes the critical dimensions and perspectives that enables the system as a whole to be represented. This also enables it to be also broken down into small chunks so it can be considered in multiple ways, combined and recombined repeatedly and at diverse levels (Ostrom, 1999).

The above literature and complexity techniques provide guidance to practical characteristics that fit to theoretical frames to help represent complexity as a heuristic to increase understanding and utilization that complexity:

- Inclusion of multiple and diverse perspectives and means of measuring them;
- Scope to include social and technical perspectives
- Provision of a logic flow representing a micro-meso-macro dimensions to capture short to longer term and to connect activity to outcomes; providing a proxy or complement to time as a means to frame immediate cause/effect and flow-on effects and patterns;
- The meso dimension and production factors/changes should be brought to the foreground as a focus for understanding of importance of the formative factors
- Capture of bi-directional and omni directional interdependence and potentially recursively cumulative results as a consequence of receipt and response to feed-back signals;
- Openness to exogenous signals;
- Clarify capital(s) to activity connections as the basis of change; and
- Role of culture, behaviour, power and politics

These factors need to be represented in a form that helps people understand the scope and interdependency of connections and associated dynamics that contribute to complexity in a simple framework that supports utilisation as a policy framework and supports explanatory narrative.

How complexity is represented and how to work with it as a dynamic system are two separate issues. The following describes the diagrammatic representation as a precursor to combining it with its utilisation to address the above characteristics.

The form is a two dimensional meta-framework represented as a panel or map. following a macro to micro taxonomy; each dimension includes multiple perspectives reflective of the policy context and generating the horizontal axis of the meat-framework:

- **The macro dimension**, articulated as the longer term and/or broader societal, strategic goal – a motivating purpose reflecting & balancing societal values. The touchstone to frame thinking, narrative, legitimacy and action;
- **The meso dimension**, articulated as meaningful, measurable outcomes – Examples of these complementary objectives include the triple bottom line perspectives or if the policy focus in socially focused key social outcomes sought as contributors to the macro goal. The inclusion of a set of complementary outcomes or objectives creates the second dimension and transforms the representation from a linear to a systems logic. The definition of these elements and the combined stance is a function of cultural context, what is valued and associated environmental, economic and social conditions and balance within this context. The tangible/intangible condition of these outcomes is a function of the outputs produced by the activities represented at the micro dimension;
- **The micro dimension**, this dimension profiles the rows of "on-ground" elements, consolidating the inputs, activities and outputs dimensions of the program logic sequence. In this general from activities reflect a broad progression from natural resource through primary to tertiary activities to community and governance. This reflects activities being represented as some form of progressive value chain, or in the case of, for example education and health policy "determinants", allowing for the interdependence between the activities (or determinants) to be identified by analysis and from this, where a change in the condition of one element flows forward through that chain to influence outputs along the chain. Outputs are captured as measures associated with the activities.
- **Policy Resources and Interventions,** these reflect community capitals with an explicit recognition of governance institutions and management. This is positioned as the capital resource stock that can be applied to the activities or further developed to enable and increase in flow to activities as the formative drivers of the system.

This program logic derived sequencing of dimensions is augmented by inclusion of:

- **Cultural Perspectives** – Values, priorities, norms and traditions frame the definition of outcomes defined within the meso dimension; cultural practice fundamentally impacts the stock of capitals available and their application to activities to produce outputs. The link between the utilisation of capitals and their application to specific activities is moderated through cultural practice.

The macro and meso dimensions define the strategic intent that frames the policy direction. The macro perspectives place a policy issue in context. Following Torgeson's observation (Torgeson, 1986) that the key issue at stake in policy making is "quality of life" outcomes provide a means of framing objectives at the meso dimension in a form that is relevant and

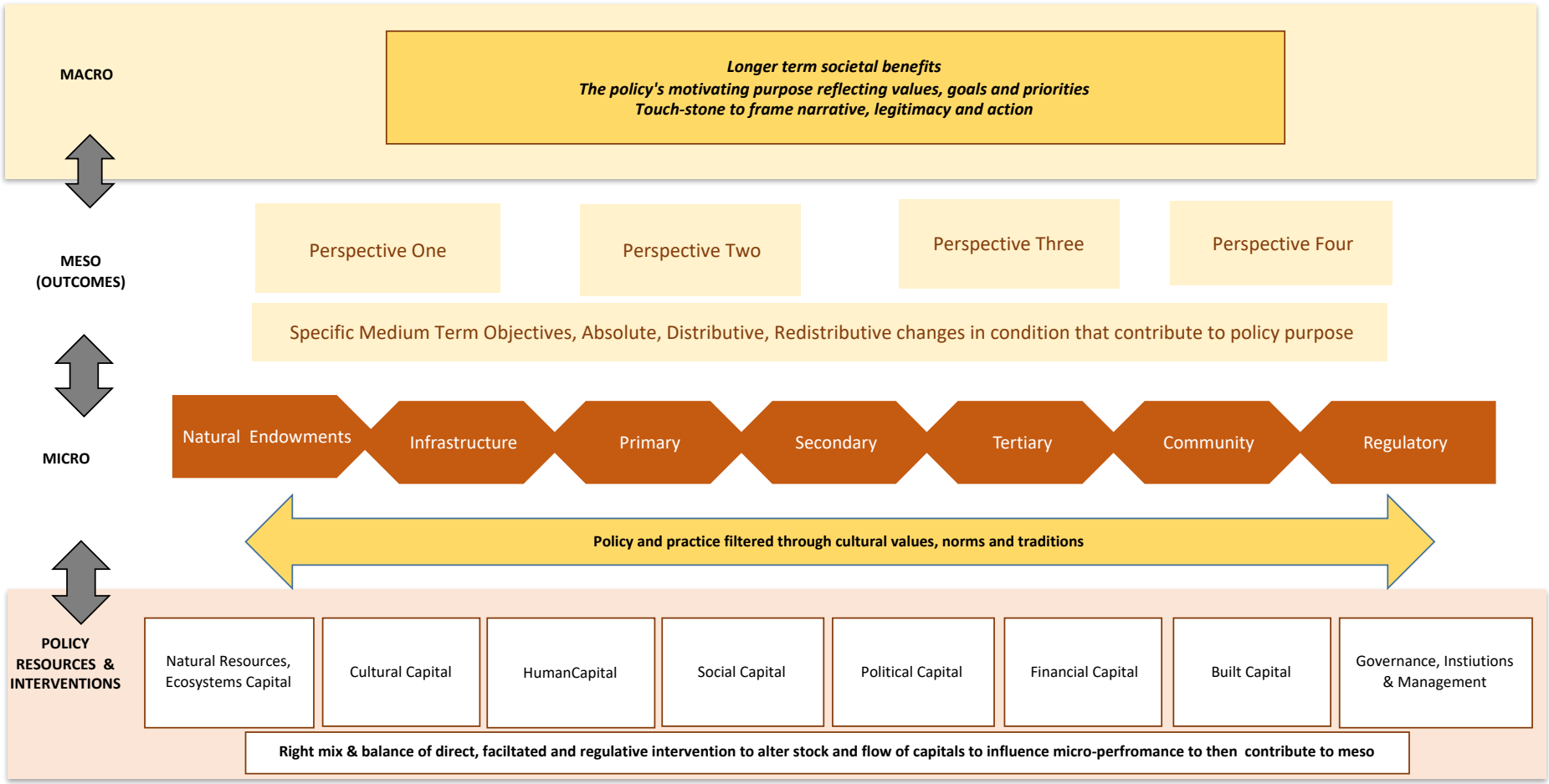
meaningful. This is fundamental to the efficacy of the systems framework in providing a strong policy narrative.

The lagged contribution of changes to and between micro dimension outputs and flow-on to the meso dimension are able to be tracked as cause/effect relationships. The inputs defined as policy interventions are framed within the community capitals"scope utilising direct, facilitative and regulative intervention approaches independently and in concert as designed to fit the context as represented as a dynamic system.

The system representation is open, exogenous influences can be directly identified as impacts on the micro dimension by analysing impact on activities and on the capacity to intervene in particular ways. The meta-framework representation is designed to facilitate analysis of how these shocks, and other designed interventions, propagate through the system as shocks or development scenarios respectively.

These characteristics and relationships combine to provide a two-dimensional representation. Fig 2.1 below is a general model using the micro to macro dimensions and ecological, economic and social perspectives to bound the space.

Figure 2.1 Meta-framework General Form



Why this Architecture?

The system architecture is founded on the Torgeson proposition that what is really at stake in policy making in an advanced democratic society is the quality of life for individuals, communities and society in a context where those interests may not be homogenous in either scope or priority (Torgeson, 1986)

This positioning helps draw out a number of key meta-framework design characteristics, quality of life is based on;

- Multiple perspectives, which differ in scope and weighting between individuals, communities and societies;
- Longitudinal dimensions, the immediate, medium and longer term as consequential direct, indirect and induced effects, with the medium and longer term tending to be a function of multiple direct interventions, shocks and changes;
- The conscious application of a capital stock to an activity which will make a positive contribution to specific quality of life goals, this stock can be both endogenous and exogenous in source;
- Capacity to receive and respond to signals from endogenous and exogenous sources to enable adaptation; and
- Cultural factors and values determine the critical factors of quality of life, what contributes to them and how they can be realised.

The representation of complexity as a meta-framework is the first step in understanding, explaining and utilising complexity as an opportunity to design, implement and evaluate policy that recognises and responds to the context. This form is designed to assist in identifying and analysing the connections and dynamics inherent in the context and its multiple perspectives and interdependencies.

The vertical dimension is reflective of the program logic progression; as a heuristic the notion of dimensions provides for important multiple, complementary policy factors to be conjointly considered as summarized in Table 2. 3 below. The bi-directional nature of cause/effect and consequently the direction of the lead and lag relationship, is highlighted by the arrows.

Table 2.3. Program Logic Dimensions and Applications

CAUSALITY	DIMENSION	DURATION	EFFECT	SCALE	LOGIC FOCUS
⇕	**MACRO**	LONG RUN	INDUCED	NATIONAL	IMPACT
⇕	**MESO**	MEDIUM RUN	INDIRECT	STATE, REGIONAL	OUTCOME
⇕	**MICRO**	SHORT RUN	DIRECT	SUB-REGIONAL, LOCAL	OUTPUT
⇕	**CULTURAL FILTER**	BASIS FOR APPLICATION OF VALUES, TRADITIONS AND PRACTICE AS DETERMINANT OF POLICY PRIORITIES AND INTERVENTIONS			
	POLICY INTERVENTION	CAPITAL INPUT AND ACTION BY ACTIVITY MIX			

These factors are explicit and inherent in the framework, allowing for specific and conjoint consideration of the dimensional characteristics. The" double head" arrows indicate the bi-directional connection and interdependence between the macro dimension through to the micro and vice versa.

The inclusion of multiple perspectives (Elkington, 2018), and specific the contextual building blocks (Ostrom, 1999), in the horizontal plane of each dimension creates a two-dimensional construct which enables the connections and interdependencies within and between rows to be represented, analysed and explained. This construct allows for the omni-directional relationships between all elements to be identified and considered; the system is open to signals from any point within the system, including exogenous signals impacting any system element and the consequent propagation through the system.

The meta-framework maps the system's strategic intent in the macro and meso dimensions; the representation of the explicit connection between the use of capitals as a policy input into micro dimension; while also creating a logical connection from the micro through to the macro dimension (Scoones, 2009), connecting practice to strategy or the policy outcome sought. The inclusion of the capitals framework as the stock and potential for intervention brings the societal and economic formative factors to the fore (Arthur, 2014), these capitals and the cultural perspective, its values, traditions and practices form the foundations for policy.

Explicit inclusion of the cultural dimension is designed to create both an overlay to the system as a whole and a specific filter to ensure the meta-framework reflects a socio-technical balance (Scoones, et al., 2007). As an overlay it influences the scope and definition of the

building blocks that create context and their relative weightings, supporting the questioning of why such factors and weightings; and from this an understanding of the cultural filter that influences both the range of activities/determinants that are evident in the policy arena and the mix of acceptable ideas, capitals available and able to be applied. This cultural perspective, a determinant of the heterogeneous nature of places creates a policy paradox in terms of balancing multiple responsive interventions to address difference with the seeking of cultural change as a policy outcome/intervention mix (Lodge & Wegrich, 2016).

As heuristic, the framework architecture provides flexibility, supporting its use across policy arenas and themes.

Transforming the meta-framework to the policy arena

At this point the representation is only a hueristic, a means of influencing how we think about thinking about complexity and from this and input into facilitating its effective use with other complementary information ordering, analytical and design frames and tools to design productive policy and strategy.

The meta-framework is analogous to a geographic information system (GIS) base map, it includes the base dimensions and characteristics, enabling diagrammatic or thinking overlays; including:

- utilising the complexity thinking models and tools identified above within context
- populating the elements with quantitative and qualitative information;
- profiling the intersection of key technical and cultural trends, political and power relationships with the elements;
- facilitating discussion of the structure, element conditions and "what if discussions and scenario tracking" across multiple perspectives and with a combination of specials and lay input
- defining the impact and outcomes sought as the basis for intervention design;
- considering the contribution of activities to outcomes;
- linking changes in the stock and flow of capitals to activities and outputs; and
- discovering and understanding how the context operates.

The use of the meta-framework for thinking and discussion provides the basis for more formal, targeted analysis.

Chapter Two led to the heuristic as a general representation of a dynamic systems logic meta-framework designed to reflect the characteristics of a CAS based on the progression of policy making thinking and frameworks from an "event" towards "systems" frameworks.

The following chapters focus on the use and transformation into a dynamic systems logic heuristic and meta-framework approach to "place, people and policy", and creating value from the understanding and utilisation of complexity.

Chapter 3 – Meta-framework Application to Regional/Rural Development Context

Introduction

Place is the major orientation (Lukes, 2005 (1974)) within the OECD New Rural Paradigm (Ramandan, 2012), its evolution into Rural Policy 3.0 (OECD, 2018) and the underpinnings of evolutionary economic geography (EEG) (Martin & Sunley, 2015). How the concept is utilized as a frame to integrate activity and capital policy themes to simultaneously achieve target macro and micro results that is the emergent challenge (Varga, 2015).

Chapter Three focuses how the meta-framework can be transformed to a specific policy setting which integrates the principles of the systems thinking approaches identified in Chapter Two using "place" as the context. The focus on regional/rural development reflects the progression of regional/rural development policy from specific sectoral and structural intervention towards an explicit place development context. The chapter brings together the identified determinants of complexity, connectedness, dynamics and contestability with the role of the meta-framework in representing, understanding and explaining complexity as the basis for creating value through policy and strategy.

The chapter is organised into three sections:

- An overview of traditional Regional/Rural Policy approaches;
- Introduction of the New Rural Paradigm and
- The design, explanation and application of the meta-framework within the context framed by this and Chapter Two.

Regional and Rural Development Policy

In Australia regional and rural development policy is framed by the three levels of government, their responsibility, focus and policy stance:

1. Commonwealth;
2. State; and
3. Local Governments.

The Australian Constitution is silent on local government, which operates under heads of power provide by various State and Territory Local Government Acts. In addition to these levels of formally legislated government, a wide range of place designated regional development entities have been formed to address development challenges over areas that encompass a number of legislatively defined local authority or municipal areas. Some of these entities operate with legislated authority to pursue specific beneficial objects, these include statutory authorities and state owned companies.

While interstate cross-border transport and other initiatives and entities were periodically formed by the Australian Government, the first Australian agency focused on regional development in Australia occurred with the formation of the "Department of Urban and Regional Development" by the Whitlam Government elected in late 1972. The specific commonwealth focus on regional development has varied over time, at times combining a regional focus with a range of specific agency functions. Similarly. within States the focus on regional development varies with the policy stance of the government of the time, some forming regional development entities while retaining traditional sectors or functional structures to ministries and agencies. Local government makes wide use of collaborative structures to create regional mechanisms; these vary widely in focus and performance; while some are effective development agencies, others focus on providing a collective voice in political advocacy.

Federal governments use specific mechanisms to create a means of investing in regions, either on a programme basis or as political investments in electorates.

As an overlay to this commonwealth structure, Australia has a long history and culture of equalisation. This principle was formalised through the Commonwealth Grants Commission:

> *"The Commonwealth Grants Commission was established in 1933 with the task of providing advice to the Commonwealth on the payment of special grants to States in recognition of these fiscal differences. Early in its existence, the Commission developed its principle for determining a special grant as being that amount necessary to make it possible for a State to function at a standard not appreciably below that of other States.*
>
> *The Commission's role expanded greatly in the late 1970s, when under the 'new federalism' policies of the Fraser government, the Commission was given the task of assessing the relative financial capacity of all States and to recommend to the Commonwealth the allocation of Financial Assistance Grants so that each State could provide government services at standards not appreciably different from the standards of government services provided by the other States."* (Australian Government, 2018)

This philosophy and structure have been replicated within states to address inequalities between the local government areas lying within their jurisdictions through a mix of recurrent payment complemented by project investment through agencies. This mix of philosophy, policy and practice has engendered a dominant focus on inequality and disadvantage. A complementary expectation is that the service focus of government is equalising through providing funds, services and infrastructure.

Consequently, the development narrative and the role of "leadership" and its associated discourse has generally adopted a gap closing, problem solving approach. One which attempts to achieve equalisation through a range of strategies including infrastructure investment, industry relocation, new business start-ups, advisory services and cluster establishment and focused on employment generation or "service retention and

equalisation". A key emphasis is on safety, access and employment. During periods or relatively higher unemployment, specific initiatives investing in local infrastructure and/or environmental degradation have emerged to provide income for effort and training.

Investment in infrastructure is long established in Australia as an intervention to improve economic performance, productivity and direct employment; it's high local employment and income multipliers provide an immediate and consequential impact, although short-term. Australia has arguably over-utilised physical infrastructure investment as an intervention lever in regional development, an approach, which along with others, have not been evaluated in terms of their effectiveness and return (Productivity Commission, 2017).

Australia is not alone in the use of infrastructure investment or other centrally determined interventions. OECD countries have utilised similar profile of interventions to address regional disparities. Varga in exploring the evolution of regional development policy (Varga, 2015) notes the inception and progression of centrally determined initiatives applied across regions in an attempt to achieve regional convergence in terms of specific outcomes such productivity, employment and income levels. The first generation of these interventions focused on infrastructure and services investment and direct subsidies to attract/retain enterprises within regions. The limited success of these led to a second wave aimed at building indigenous capacities related to knowledge intensive economies via education, Research and development support and promotion of university-industry linkages or encouragement of entrepreneurial activities (Varga, 2015).

The heavy emphasis on transport infrastructure investment and applying often wasted resources to support declining industries in lagging regions through centrally administered redistributive systems has been causal to creating a culture of bail-out and dependency. Dependence on outside support saw some sectors and places, undertake active rent seeking behaviour. These outcomes have combined to mobilise criticism of regional development approaches (Productivity Commission, 2017) (Varga, 2015) The dominantly top down philosophy, with little or no coordination between different programs organised by different government agencies (Barca, 2009), resulted in interventions were applied largely through a space blind or space neutral policies.

This dispersed, top down, and space blind policy and funding construct has resulted in regional and local governance and development entities that tend to be resource poor and as a result these entities have focused on identifying interventions that fit with external government funding criteria rather than identifying a more productive intervention profile that often fails to meet external funding focus and criteria. The OECD demonstrates a clear shift in thinking and theory related to regional development in the new regional development paradigm construct (OECD, 2018). This approach to regional and local development, the approach extends cluster and platform theory (Cooke, 2012) by including wider perspectives, connecting micro to macro dimensions to assist in mapping and facilitating better understanding the specific contexts (Bamberger, 2008) within which development occurs as the basis of a reflexive and adaptive innovation, performance and productivity management approach across the regional system.

Place as a policy construct

"Place" is firstly a spatial, geographic construct; it is also relational in form and function: *an assemblage of relations reconfigured through processes of restructuring and continuously changing as a result of economic, institutional and cultural transformations* (Woods, 2015). Woods's descriptor summarises key perspectives in regional development and place-based approaches and provides the foundation for the theory and practice outlined in this chapter and framed within the complex adaptive systems theory and its specific characteristics (Cilliers, 1998) introduced in Chapter Two.

Geographically focused development has its roots in regional economic development approaches, reflecting the reality that in regionalised economies, the "free market does not function well for all regions simultaneously and macroeconomic policies applied throughout a nation will not suffice to eliminate the faults in market performance" (Savoie, 1992) . Savoie further identifies that regional development falls into no single discipline, it is of interest to economists, public policy, public administration, political science, sociology, geography and demography implying the need for a broad perspective including "many rivulets of thought" rather than policy as the "product of a single, linear progression of events and ideas. This is highlighted in the "Triple Bottom Line" (Elkington, 2018) construct and socio-technical approaches to policy analysis, design and management.

Savoie's conclusion (Savoie, 1992) reflects the fundamental difference between "place" as a development construct and the commonly utilised "sectoral" construct, in particular the nexus between people and place central to placed based approaches and the dominant "technical" development approaches applied to industry sectors. This difference is expressed in a deliberately stark and somewhat inaccurate and provocative manner to contrast the integrated approach posed by Savoie and the linear progression policy model identified as the alternate and dominant model this approach does not preclude more linear sectoral development approaches, but rather argues that "place development" can provide a context for improved sectoral development policy and strategy.

While Savoie focuses on regional development, the concept of place is spatially scalable providing a useful additional construct to local regional and national governments. The challenge is how the notions of place, people and sectors, in the context of collective values, aspirations and capitals converge to form a framework to support engagement, understanding and productive management of policy challenges. A complex systems approach supports the integration of a wide range approaches and tools that have previously and frequently been used in isolation to design a policy/strategy set to be applied in dynamic meta-framework.

Considering the concept of place as an assemblage of relations reconfigured through processes of restructuring and continuously changing as a result of economic, institutional and cultural transformation (Woods, 2015) establishes the definition of place as being contextual. The relationships perspective introduces the importance of networks and connectivity

(Horlings, et al., 2018) and of relations and interdependency; with places viewed as nodes in networks, as intersection points in which the global and local are interconnected (Placeholder6) (Horlings, et al., 2018); in a regional context sectors and institutions provide the connecting nodes. The place-based concept enables inclusion of consideration of complex geographies, capabilities, knowledge sets, assets and resources of particular places enacted through networks, embedded, multi-scalar and multi-annual strategies (Bentley & Pugalis, 2014), (Horlings, et al., 2018). The OECD positions local economic development as a multi-sector form of public intervention, and arena for substantial innovation, where leadership can set the agenda and build the context for progress (OECD, 2015)

The key perspectives introduced from this foundation are identified as:

- Assemblage – how elements "fit" and influence;
- A socio-technical system - economics and other development streams are connected, not isolated, if the focus is "economic development" consideration of other factors that complement or inhibit this development are important considerations and aspects of inclusion in associated development policy, with major weighting toward economic outcomes;
- Connections, relationships and process – both within the place and between places and encompassing dynamics from influences on and changes in, economic, social and cultural perspectives; inherent in these aspects of institutions, leadership, power and legitimacy;
- Reconfiguration - restructuring – either by circumstance or choice;
- Transformation – across multiple dimensions, transformation agency and agents; and
- Continuous change – challenging the notions of equilibrium and linearity.

These factors are ubiquitous, but also vary in their specific characteristics between places to create an almost infinite range of narratives around place and the discourse that drives or constrains the currency of ideas and development. These factors are central to the characteristics of processes and patterns involved in place and their evolution that requires development to consider wider economic, institutional and socio-political dimensions to generate a more systemic, holistic understanding of spatial economic evolution (Martin & Sunley, 2015).

The associated interrelationships and response to feed-back from and between the elements of such systems and the associated, non-linear dynamics (Capra, 2002) of the assemblage, results in uncertainty and the importance of recognising and understanding patterns (Cilliers, 1998) from an awareness that very small changes in some elements of an active system can alter the long term behaviour of the system (Holden, 2005). The capacity for systems to dissemble and reassemble in differing circumstances to create new connections and dynamics (Ostrom, 1999), provides both new challenges and opportunities on a continuous basis. The assemblage of building blocks within the system (Ostrom, 1999) further allows for complementary use of reductionist approaches within the system, excising an issue for analysis and decision and re-inserting it into the system frame for analysis of the propagation of change prior to final decision.

The self-organising nature of systems highlights the differentiation between development through active intervention by government and evolution as singular and joint determinants of place performance through the application of exogenous and endogenous resources and influences (Martin & Sunley, 2015). The nature and impact of these evolutionary factors is potentially lost in economic development policy and modelling that is framed by intervention in a traditional structural form, often utilising space-blind macro tools; thus, the identified challenge in linking the macro to micro dimension of development (Varga, 2015).

The theoretical frames that relate to the above converge and interact in place-based policy setting, which because of the absence of "degrees of separation", highlights the utility of the theory to practice connection. Focusing on the above factors introduces the notion of place as a system and also as a particular type of organization, a perspective considered important in both how development policy is designed and implemented in that place, how effective it is and also in how macro policy is implemented "in place". This organisation is not necessarily subject to consistent hierarchical influence-power across specific perspectives or for the place overall, the interaction of formal and informal structure in relation to specific issues and over time is consistent with the generation of the wicked problem (Batie, 2008).

Pllace-based development and complexity are now centre-stage, challenging the linear notion of traditional cause/effect relationships when they are considered at sub-national scale. Key institutions such as the World Bank, the OECD and the EU have explored, adopted and adapted a range of practices and approaches that have been evolving in places over two decades and from this analysis developed theories and approaches that coalesce within the new development paradigm. This Chapter uses "application of the meta-framework" to combine theory and practice within this new paradigm context.

The discussion outlines the application of the meta-framework to support understanding the scope of dimensions and elements that combine as an adaptive system to form a region or place as the basis for analysis. It also references the meta-framework utility in understanding and explaining how a "place works" as a precedent to then develop, implement and as necessary adapt a mix of strategies designed to achieve collectively valued outcomes. This application is simultaneously located in the "new paradigm" context and place-based development (OECD, 2009).

OECD New Regional Development Paradigm

The Australian Productivity Commission (Productivity Commission, 2017) drew conclusions relating to endogenous potential and the potential of interventions beyond infrastructure that are consistent with the principles contained in the shift from an "old paradigm of regional development" that sought to compensate lagging regions to a "new growth oriented paradigm" based on the principle that that all places have the potential for economic growth through the application of "place-based development policy" (OECD, 2009)

The OECD codifies the difference between the two paradigms as follows:

Table 3.1. OECD – Old and New Regional Paradigm Comparison

	Old Paradigm	New Paradigm
Objectives	Compensating temporarily for location disadvantages of lagging regions	Tapping under-utilised potential in all regions for enhancing regional competitiveness
Unit of Intervention	Administrative units	Functional economic areas
Strategies	Sectoral approach	Integrated development approaches
Tools	Subsidies and state aids	Mix of soft and hard capital (capital stock, labour market, business development, social capital and networks)
Actors	Central government	Different levels of government

(OECD, 2011)

While demonstrating difference, the comparative table does not identify the importance of the necessary, complementary supportive and flexible institutional framework as a critical enabler (Pugalis, 2016). Decentralisation, or at least re-balancing between de-centralisation and centralisation, impacts the relative influence and resource capability of central and regional/local government and complementary public and private institutions, formal and informal networks is a structural, rules and process dimension to be resolved within this new paradigm. As with much policy, the tendency to make binary decisions limits the concept of integrating, contextualising and weighting the mix of central development objectives and local contexts is a strategic, design and governance challenge captured in the "who leads, who resources, and who governs?" discourse.

These questions lead to a further key dimension of this paradigm discussion is the consideration of "space blind" and "place-based" policies or interventions. The differentiation between these is at the centre of the comparison. The first generation of these macro interventions focused on infrastructure and services investment and direct subsidies to attract/retain enterprises within regions. The limited success of these led to a second wave aimed at building indigenous capacities related to knowledge intensive economies via education, Research and development support and promotion of university-industry linkages or encouragement of entrepreneurial activities (Varga, 2015). The heavy emphasis on transport infrastructure with wasted resources supporting declining industries in lagging regions and negative impacts of centrally administered redistributive systems such as a culture of dependency on outside support, or rent seeking behaviour combined to generate criticism of regional development approaches (Productivity Commission, 2017) (Varga, 2015) Within the context of regional and local development, the approach extends cluster and platform theory (Cooke, 2012) by including wider perspectives, connecting micro to macro dimensions to assist in mapping and

facilitating better understanding the context (Bamberger, 2008) within which development occurs as the basis of a reflexive and adaptive innovation, performance and productivity management approach across "the system".

The traditional equalisation, infrastructure to place trajectory identifies the relatively global nature of regional development policies within western economies and as transferred to developing economies. The relative lack of contextual adaptation led to interventions that were narrow in scope and while transitioning from technical to social interventions, rarely combined the two. While subject to criticism, the interventions tended to improve aggregate economic performance in the face of geographic uneven and concentrate growth (World Bank, 2009) (Varga, 2015).

Place-based development is often contrasted with those relating to contemporary space blind approaches (Pugalis, 2016). Now widespread they are conditioned for contextually specific place assets and dispositions. The place-based philosophies act out in different ways in different places, Tomaney (Tomaney, 2014) highlights the European focus on development of place-based institutional innovation and capacity, a challenge when places when defined in economic terms do not necessarily match administrative areas; while US practice tends to focus on spatially targeted, multiple interventions that originate in that local place (Hopkins & Ferris, 2015).

While much is made of the differences between the old and new paradigms, space-blind and place-based approaches, all are focused on growth and each contains elements that will complement the other and can arguably be combined to achieve the mix of outcomes that are inherent in place-based strategy. Never the less, the key emerging practice in the development of place-based regional development utilising the new paradigm approach. In practice this is occurring within broader policy, with central and federal government steering likely to shape the capacity of place-based governance bodies and institutional framework (Pugalis, 2016) and the levels of governance established to oversight place-based development.

Achievement of goal congruence is the focus of alignment of complementary levels of government, from national through to local; integrating two approaches, one focused on aggregate performance and the other on local. While both have a geographic construct; place-based, as described in the OECD construct (OECD, 2018) (OECD, 2009) and applied to the Australian context reflects a functional economic area such as a "wine region" or similar. Federal government policy tends to focus on space blind, or space neutral policies developed from a national contribution perspective for example aggregate export revenue, performance and productivity/competitiveness; at the regional, or local level the focus is on how the industry contributes to economic, social and environmental outcomes; a wider construct focus than that of the national focus. Combining these two perspectives is a global challenge to the structure of government administration and policy development.

This identifies the potential for turn-about top down and bottom up approaches (Hoppe, 2018) and also potential congruence between space blind and place-based development policy.

Such congruence is required nationally and locally to define and achieve common objectives is a key challenge for resolution. The response to this challenge differs, Varga (Varga, 2015) identifies the challenges in modelling place-based approaches as they apply to the EU regional construct; the premise of the challenge is how to translate the meaning derived from national and transnational models to the regional space and the construct for place-based interventions. Varga (Varga, 2015)cites the example of applying EU technology development programs across regions, and identified that not all regions are technology intensive and in "those places"; a complementary intervention towards increasing university places and focus towards this can contribute to increasing the incidence and application of new patents towards those places that already have the technology strength. This intervention mix reflects a combination of space blind development policy and place-based disadvantage mitigation to both increase innovation and its application and to increase the stock of human capital.

Implementation of space blind policy in a specific place carries with it challenges that extend beyond the technical. Scoones (Scoones, et al., 2007) provides a strong focus on and rationale for socio-technical approaches to development, a recognition that the specific traditions, practices and culture of a place and their impact the productivity of an intervention. This introduces the importance of considering and designing to achieve the relevance and appropriateness of both the mix of strategies and how they are implemented. The impact of extant social, cultural and economic conditions is highlighted by analysis of factors contributing to the implementation of the Cultural Heritage Entrepreneurship in South East European Countries, the *Sagittarius Project* (Zaman, 2015). The recognition of the evolution of the economy, or not, as premised in evolutionary economic geography (Martin & Sunley, 2015) provides a contextual basis to the application of development interventions; in effect identifying social and human capitals that can enhance or block interventions and innovation. Understanding these factors and attendant regional community willingness and capacity to engage with space blind interventions is an important complement to the technical relationships defined in tools such as input/output modelling and its application in benefit-cost analyses. While it is recognised that small area multiplier modelling is prevalent, the assumption that the "top down" intervention can be implemented using a consistent methodology and that the consequences are predictable is dangerous.

While Varga's simulation indicates the mix to be viable and valuable, it is arguably a retention of top down regional development and inconsistent with the OECD place-based principles related to the identification and development of endogenous capacity unless recognised and responded to. The example, while motivated to identify challenges in modelling, highlights the variation between intervention instruments, instruments to stimulate the existing capital stock of a place and instruments to develop additional human capital which in turn develops further intellectual capital. A fundamental difference between space blind and place-based approaches is outlined in Table 3.2 below.

Table 3.2. Space Blind & Place-based Policy Characteristics

	Space Blind	Place
Outcomes Focus	National Aggregate Economy, Health	Regional, sub-regional and local wellbeing
Intervention & Instrument Focus	Stimulatory	Stock & application of community capital

Source - Author

This differentiation indicates that place-based development is largely focused on the utilisation and development of current, potentially latent and developable community capital, supported where possible by e.g. national space blind interventions and arguably that national space blind interventions may be more productive if contextualised to place and supported by community capital development.

The place-based modalities advocated by the OECD and Barca stress:

- the priority of long term development strategy based on highly tailored interventions rather than "off the peg" solutions to reduce persistent inefficiency and inequality in specific places;
- a focus on strengthening formal and informal institutions, including governance;
- an emphasis on endogenous growth in the most advanced sense of smart specialisation (Foray, 2015) and smart process of evolution that builds on the traditional economic strengths of a region or country, while complementing these assets with new knowledge-based activities that enable the economy to progressively shift towards higher value-added productions to facilitate endogenously distinct growth pathways and development
- Strategies derived from assets, capabilities and conditions particular to place; therefore, integrated strategies are favoured over sector-based strategies
- The need for bundles of integrated, place tailored public goods and services, designed and implemented by eliciting and aggregating place-based preferences and knowledge through participatory political institutions and by establishing linkages with other places
- Investments are favoured over subsidies
- State as a broker promoted from outside the place by a system of multi-level governance where support is conditional upon both objectives and institutions transferred from higher to lower levels of government (Barca, 2009)

Moving from theory to practice is bi-directional with the analysis and evaluation of practice leading to development of existing and of new theory and vice versa. While place-based approaches are viewed as a persuasive notion and policy response, modes of working are identified as lacking conceptual clarity and operational precision (Bentley & Pugalis, 2014).

Communities expect much of government and associated regional structures in supporting strong regional and local economies that also deliver ongoing, valued social and environmental outcomes. All levels of government have a role to play in this through policy setting, intervening and investing, using a mix of governance and development mechanisms in an arena increasingly open to external shocks and opportunities.

The regional and local geographic/spatial constructs of this governance system make obvious a level of policy complexity that is not always evident in state and federal government structures. The convergence of people, place and prosperity at this smaller scale highlights the existence and interdependence of many more perspectives than is often evident in the relatively narrow policy perspectives and structures associated with ministerial responsibilities and government agencies at superior levels of government. The scale ensures that innovation, performance and productivity deficits or advantages are highly visible.

This convergence reinforces the interdependencies between what are often addressed as policy silos or streams when applied to a place that reflects an identifiable community of interest and transparent interdependency.

To provide the conceptual clarity and operational precision identified as lacking by Bentley and Pugalis (Bentley & Pugalis, 2014) as lacking, this chapter outlines and proposes a meta-framework and associated tool set to assist in understanding, analysing and governing the complex, multi-perspective reality that characterises regional and local development. Provision of such clarity supports the necessary operational precision to then enable design and management of an appropriate mix of performance and productivity focused policy and management interventions. The approach is based on "adaptive systems logic" underpinned by dynamic, complex systems thinking that responds to both exogenous and endogenous derived influences. This builds on and extends the thinking around geographic clusters, their fit to the characteristics of a complex adaptive system (CAS) (Carbonara, et al., 2010), the use of platforms, that while including clusters can also include other non-cluster organisations and with this multiple perspectives related to broader considerations related to sustainability (Cooke, 2012). The inclusion of "open systems" reinforces the potential for external shocks and opportunities to influence the regional and local system and its performance.

Governing at the regional and local dimensions is arguably much different than governing at the state and federal levels. Apart from the obvious differences in scale and revenue:

- regional and local government have limited separation between people and their governance structures and mechanisms;
- the convergence of place, people and community with its multiple and transparently interdependent policy perspectives and streams highlights that interdependency in a manner not as obvious at the state and federal level; and
- the impact of intervention or shock is much more rapid than at the state or federal level.

These characteristics result in a highly dynamic, connected and contested policy environment. While these characteristics are arguably consistent with broader global and national trends,

they are clearly evident as impacts on local governance. As a result, linear, reductionist problem solving methods that have dominated regional and local governance models are likely to fall short in matching to the complexity of such challenges.

The test for meta-frameworks and associated models is their capacity to engage institutions, people, and frame "how we think about thinking about" things to develop understanding within their domain of interest and responsibility and to assist them to confidently make decisions. In pursuing this goal, diagrammatic representations and mathematical models are applied to support this decision making, however these tools have tended to demonstrate the specific descriptive, relational or predictive findings of narrow analytical constructs or options.

In western democracies, regional development has primarily occurred in response to a culture and governing principles around:

- Equity, cohesion and equalising;
- Contribution of policies, sectors, strategies and agglomerations to the macro agenda; and
- Optimising public expenditure on servicing the regions.

These principles create active intersections between political, social and economic perspectives as they apply to that place and the associated culture, formal and informal instruments and mechanisms that frame development and are necessary factors to be considered alongside the technical economic theory. In parallel there is a less formal, self-organising evolution occurring within enterprises and households and their interconnections in response to signals receive from the system

The meta-framework frames and stimulates questions and supports the development of systemic responses across key elements of the policy development process, including those relating to:

- What is the condition of the place and how is it changing – responding and evolving;
- How does the condition in one element of the system relate to others; and
- From this enabling connection between the micro-meso-macro dimensions to enable multi-level system learning, abstraction and deep contextualisation (Dopfer, 2005) (Martin & Sunley, 2015) (Varga, 2015) (Cooke, 2012)

Leading to key rhetorical, inquisitive questions:

- How does the condition at the meso level and the stock and utilisation of community capital impact on the lives and futures of the households and people who populate the place; and
- What if…….

The role of the meta-framework and associated process in supporting leadership and associated institutions and networks in aligning to place-based development (Horlings, et al., 2018) is central to defining key questions that are relevant to the development of that place within context.

Information applied within the framework is used to:

- Represent & describe;
- Analyse;
- Reflect and understand; and
- Explain regional dynamics, performance and development.

Within each of the above stages people use their values, experience; their interpretation and interests to make decisions to utilise the resultant form of the information to influence, plan, manage and evaluate. The basis for this utilisation is knowledge, enhanced or not, with a wide range of cultural, social and technical structures, processes and techniques, reinforcing that the notion of bounded reality (Simon, 1976) is influenced by both knowledge (Lasswell, 1970) and culture.

The Twentieth Century saw the broadening of quantitative analysis and its application to decision making. This occurred through the use of information gathering, filtering, storage and the application of analytical models; which are becoming increasingly complex and potentially realistic as representations through the development of machine learning and artificial intelligence. However, "rational" such policy decisions are in the western democratic tradition, the policies and consequences still need to work in a highly dynamic and contested environment. The interconnected nature of values, interests, narratives and data to facilitate and articulate decisions that affect a population, necessitates a considered mix of the qualitative and quantitative and mediums of representation and distribution.

Economic impact evaluation has provided estimates of the impact of policy interventions on macroeconomic variables such as GDP and differs from micro-economic evaluation of immediate and flow-on the impact of projects (Varga, 2015). This increased focus on quantitative evaluation to support decision making arose post world war 2, based on the contribution of related techniques in military production. The relationship between policy at the national level and strategy and projects at the regional or local levels is important, it provides a key macro-micro linkage but provides a significant modelling challenge (Cooke, 2012), in particular with the emergence of the new paradigm in regional development (OECD, 2009) and place-based economic development theory and its geographic focus to policy.

Within regional and rural development, these linear and reductionist approaches provide value in developing understanding. They are in effect however, second level, subsidiary analysis defined and utilised within "custom and practice", not necessarily designed to enhance thinking and understanding of context within which the analysis is focused. As accepted approaches they have become default choices, regardless of their "fit for purpose" match to the task. An example is benefit-cost analysis associated with the "Infrastructure Australia Assessment Framework" (Infrastructure Australia, 2018). A benefit-cost ratio in excess of a value of 1, based on valid scope of content and discount rates is a useful tool in prioritising between alternate infrastructure investment options using the associated problem solving/opportunity realisation model included in the assessment framework. While providing a rigorous basis for comparison between investment options and for prioritisation, in line with the

agency's responsibilities, from a broader "place" perspective, it does not consider alternate investments or blended investments to include, for example other forms of community capital that may provide a more productive means of realising the "solution", each investment carries an opportunity cost.

It could be argued that this is the role of the project proponent. It is an example of the reductionist agency silo structure of government, utilising "space blind" policy and budget tools that require proponents to design an investment project that fits guidelines. Arguably it is a robust process being applied in a space blind, rather than place context to consider and develop partial solutions that may fail to deliver an optimal result because of the infrastructure weighting and narrow focus of investment. The importance of "purpose" is highlighted in this example, it is one that challenges many agencies and in particular government owned corporations that have responsibilities and heads of power within their governance articles that are purposefully narrow, and outputs focused and with hind-sight can be identified as restricting the potential contribution of their role and reduce the return on investment associated with their functions. This challenge is clearly articulated by the Australian Productivity Commission (Productivity Commission, 2017)

In addition to clarifying the critical importance of carefully defining the purpose of investment, in particular as contribution to an outcome rather than as outputs (and associated indicators), the infrastructure example highlights the role of limiting role of specialist field domination and the constraining role of narrow analytical and decision making techniques. The increase in technocracy, usually defined as a narrow, deep specialisation, has seen the contribution of technical support change from support to default decision makers as a result of the need for quantification of the relative benefits of the proposal or options. While this contribution is important to the productive rationing of resources, the achievement of defined purpose, an adverse, or not, consequence is the reduction of broader perspectives and lay input into decisions.

Reliance on mathematical modelling of impact and broad benefit-cost ratios to support decision making, crosses all levels of government, the private, public and community sectors. Economic and financial modelling and to a lesser extent demographic and epidemiological modelling is central to this quantified, evidence based analysis. Mathematical representation of the economy and in particular industry/sector, demographic and national/regional constructs is the foundation upon which public policy decisions are made, rationalised and promoted. This is the domain of specialists and modelling structures and techniques that have been developing for 2 centuries and with the development of computerisation rapidly expanding, in particular to include behavioural dimensions and more complex interactions and predictive modelling or understanding of the formative elements of economies (Arthur, 2013) within places..

Much of the economic modelling, such as input/output modelling, utilised in regional and place development is simplified, linear, short term and uses past relationships and behaviour as a predictor of future relationships and behaviour. This form of modelling specifically focuses on jobs and income as either the decision making criteria and parameters, or as proxies for social

benefits within the well-established benefit-cost constructs utilised in regional development. These models are underpinned by other, subsidiary analysis, for example using forms of input/output, causal and regression analysis. Measurement of social and environmental impact within these constructs remains problematic, in particular applying a value to dimensions that do not have a market value but are reflective of individuals or groups personal values and circumstances.

The challenges of linking macro to micro and recognition of geographic variation is recognised in mainstream economic modelling where, for example across Europe a range of "Geographic, Microeconomic, Regional" (GMR) models have been design ad continue to be under development since 2009 (Varga, 2015). Alternate approaches such as "complexity economics" (Arthur, 2013)adopts a focus on the formative foundations of the economy, understanding the relationships between the capitals on which the economic characteristics of a place are founded and the relationship of these to economic activity (Arthur, 2013) compared with the outputs focus of traditional modelling, this brings these formative factors and outcomes to the fore.

The new paradigm and place-based development approach is underpinned by leadership that is performed by varied public, private and civic actors potentially able to bridge vested interests and make new connections to support joint learning and innovation (Horlings, et al., 2018). To enable the approach to productively perform in a place specific setting, the structures, information and modelling need to support this place-based mix and potential.

Transformation into Practice

This section outlines the development of a meta-framework and associated tool set to assist in understanding, analysing, and explaining the way places work, why and as a means of providing context to support design, implementation and evaluation of an appropriate mix of performance and productivity focused policy and management interventions across both the "whole system" that operates at this scale and for critical perspectives and elements within the system.

As presented in Chapter Two, the heuristic nature of the meta-framework has the potential to create "a home" or context to facilitate the inclusion of the preceding policy principles, thinking and practice innovations in a manner where they can create value.

A meta-framework provides a map or picture to assist in "how we think about thinking about issues, opportunities and challenges". In this dynamic systems logic approach the meta-framework provides a way of ordering the perspectives and dimensions of the challenge at hand to develop improved understanding of the context, a means of identifying and analysing connections, designing interventions while managing tensions and achieving productive improvement in the core condition. The complexity of place, in particular at the regional and local scales provides the opportunity to consider the complexity arising from connections, dynamics and contestability to create value through innovative policy and interventions.

Effective transformation of the meta-framework into practice requires it to support the representation, understanding and explanation of complexity by effectively capturing the key connections, dynamics and contests that frame and influence the design and implementation of productive policy and strategy.

A place's micro profile and activity, the input/output relationships shaping this profile, is underpinned by people, their behavioural characteristics and the manner in which they relate to the environment, other activities and each other as a consequence of their customs, norms and rules. These interdependencies and their associated governance institutions give personal, societal and political meaning and priority to the manner in which the place works and its socio-economic dimensions.

While, on a day to day level, there is a strong, short term focus on the micro dimension, people's levels of policy acceptability or preference is also driven by their perception of the medium to longer term consequential outcomes achieved from the micro level activity. This meso dimension is where distributive and redistributive characteristics such as employment levels, income distribution, health, education, social capital and ecological health characteristics are in evidence; changes to the stock, distribution and flow of community capitals. Importantly these are aggregated, multiple characteristics, determined by the manner in which the place works, in combination define the positioning of a region and the capacity of the place to compete with others as somewhere to live, invest and visit. This meso dimension provides a "half way" focus between activity and ultimate goals, outcomes that are important to communities and linking the macro and micro dimensions and their associated two-way interplay in a way that is relevant to and recognisable by people.

This technical perspective also frames the social perspective, and vice versa. The individual and communities of interests within the place are those which clarify, define and determine the importance of the perspectives and elements of the systems logic framework. This indicates the players, their interests and known positions and stances, awareness of the value and priority characteristics commences understanding of contested interests and boundaries and connectedness between various interests. These factors frame the manner in which the place works and connects to and interacts with other places. The foundational work of Maslow (Maslow, 1954), identified a hierarchy of needs which has parallels with the micro to macro construct; importantly this provides a frame that can apply to groups as they transform into a society where: rules provide the structure of how to achieve mutually beneficial outcomes; varying priorities are recognized; mechanisms exist to support the resolution of differences; and their tolerance for variation in values and behaviour within these boundaries. These "survival mechanisms" translate into dimensions of power, concepts of society (Ramandan, 2012) and its correspondence with political structures and processes which define within them the outcomes that reflect the outcomes sought by society in that place.

The motivating premise for this thesis is how to make effective policy within the "dynamic, connected and contested" nature of public decision making arena. The policy and decision making context is dynamic, arising from the scope and velocity of issue emergence and depending on the timing and "issue competition", resonance with parallel agenda issues and

relative power of proponents, escalation and pressure from action. This dynamism is interdependent with the degree of connectedness of interests, media up-take and the relatively contested nature of the issue with other interests.

Within this environment, there is a need to ensure a contemporary approach, mechanism and process(es) to:

- map an issue, shock or opportunity into a the multi perspective place context;
- enable it to be located relative to others;
- understand where the issue impacts, its direct and flow-on consequences;
- filter it with respect to relative impact, importance and priority across the range of perspectives critical in that place; and
- help decide whether the issue is operational or policy in nature of action or both.

Although political players and agencies will recognize the "connected, dynamic and contested" construct, this does not mean there is a propensity to alter their approach to reflect this complexity. The challenge to adoption of such an approach is that at the federal and state government levels, while they govern territories, government is arranged in silos based on functional and service lines, the traditional "line agencies" with budgets, interests and territories that well defined and defended; and where boundary issues are difficult. This traditional reductionism is arguably balanced through staff agencies such as "The office of the Prime Minister" or at state levels, "Premier & Cabinet"; how-ever the ability to access the agenda as the first step in the consideration process is often challenging. The influence of culture, traditions and practice influences agency operations in the same manner as it influences places overall.

Local government also tends to adopt corporate structures that delineate through operational, community and compliance structures again, ironically limiting place-based responses and planning in line with the new regional paradigm outlined above and its derivations.

These structures and practices introduce a policy vulnerability, treating contestability as a political challenge, rather than a balance of politics and policy, mitigating against resolution in favour of dampening; limiting the potential for development of high performance and productive place-based policy, strategy and delivery. This proposition draws into question the capacity of traditional policy heuristics to meet contemporary demands and whether an alternate heuristic, reflective of the context, could improve policy contribution and performance. The subsidiary question is the openness of political/policy players to alternatives.

The following section works through the phases and approaches to designing a meta-framework and utilizing complementary tools to bridge the theory and policy themes of place-based governance identified above and development to policy in place.

Designing a Systems Logic Meta-Framework for Place Development.

The following describes the basis of the dynamic systems logic approach to place-based development and resultant structure of a meta-framework and a method to apply the above principles and approaches. Following chapters focus on specific local and regional development case studies; however, the following discussion is more generally applied and not scaled to any specific categorisation of place.

The framework links place-based development factors into the practical, dynamic, multi-perspective "systems logic approach" to thinking, design, implementation and adaptation of policy and strategy. It combines the multiple dimensions and perspectives with information and knowledge necessary to support development of policy and strategy in combination with what the community experiences on the ground, to identify, create and implement their preferred future for the place.

The dynamic systems logic meta-framework that follows is proposed as a tool to support the representation, understanding and management of the way a region works as a system and to stimulate the development of a different approach to the management of complexity in public policy in relation to its development in a realistic context.

The sequence follows the role of the meta-framework in:

- Representing;
- Understanding; and
- Explaining complexity to assist in:
- Designing, implementing and evaluating policy and strategy interventions.

In each instance the roles are discussed in the context of the connected, dynamics and contested characteristics and relationships.

Representing Complexity

The strategic and governance framework is designed around a system construct that comprises form and substance; the following dimensions are proposed as the vertical axis of a two dimensional construct; it extends the well-used program logic construct to include:

- **The macro dimension**, impact – the longer run difference that is made to the place/community framed by values and aspirations, a longer-run and societal dimension. This and the meso dimension reflect the strategic focus and intent, connecting the space blind macro policy of central government and the place-based strategies; matching the national and place objective to create the challenging macro to micro link (Varga, 2015).
- The **meso or outcomes dimension**, this is the lagged, flow-on result of changes at the micro dimension. It helps answer the question "are we achieving the outcomes we seek as a place/community" from the policy intervention and associated activities,

measured in some changed in state. The scope reflects the Elkington "Triple Bottom Line" (Elkington, 1997); it disaggregates the economic perspective into "Product/Service Market Mix" to create a focus on the profile and source of revenue, including local/export focus, and "Capable Productive Population and Assets" to create a focus on paid and volunteer contribution and the use of tangible and intangible assets (capitals). The combination of the four is designed to create a focus on outcomes, their balance and interdependence and as Elkington identifies (Elkington, 2018) to ensure the TBL is not subverted into a financial accounting tool by attaching social and qualitative measures and indicators to the perspectives.

- **The micro profile and perspective**, comprising the sectoral or structural elements that captures inputs and outputs; current condition and the relationships between input and outputs. The current condition of the element and "need" of change provides the short run dimension based around day to day practice. The following is a representation of the traditional economic sectoral profile of a place, drawn from the Australian Bureau of statistics, Standard Industry Codes. The profile is represented as an interdependent "value chain", both added to and truncated; "ecology and natural resources" is an addition at the commencement of the chain, this is reflective of the basis for original settlement of most places, the remaining elements of the chain are broadly reflective of progression from this natural resource advantage through to tertiary industry, recognising that not all places make this transition or include after time the full profile. The sector approach is underpinned by the households and people, settlement patterns and demographics. People and their households interact as a society between households, as individuals and through the sectors as a society and an economy.
- **The capacity, policy & strategy mix**– change to the policy or strategy settings that directly affect the current state at the micro level and flow in some pattern to influence the meso or outcomes level. Day to day societal practice occurs within the "inputs, process and outputs" micro dimension, an understanding of its composition, specific characteristics and relationships across multiple structural, institutional and process perspectives is fundamental to identifying the conditions on the ground, understanding the associated cause/effect relationships and the explaining the predicted effect of intervention and change. These policy and strategic options are underpinned and enabled by the community capitals structure (Emery & Flora, 2006) with its tangible and intangible perspectives inherent in this mix intersect with the activities to enable livelihoods (Scoones, 2009) and quality of life that is dynamic through its capability to both utilise the stock of capital and develop further capital through investment, a formative concept (Arthur, 2013),
- **The "cultural filter"** is introduced as a key element of the representation between the micro and interventions rows. This is included to ensure aspects of community behaviour that impact on propensity for change/innovation are considered as parameters for understanding, explanation and intervention design intervention

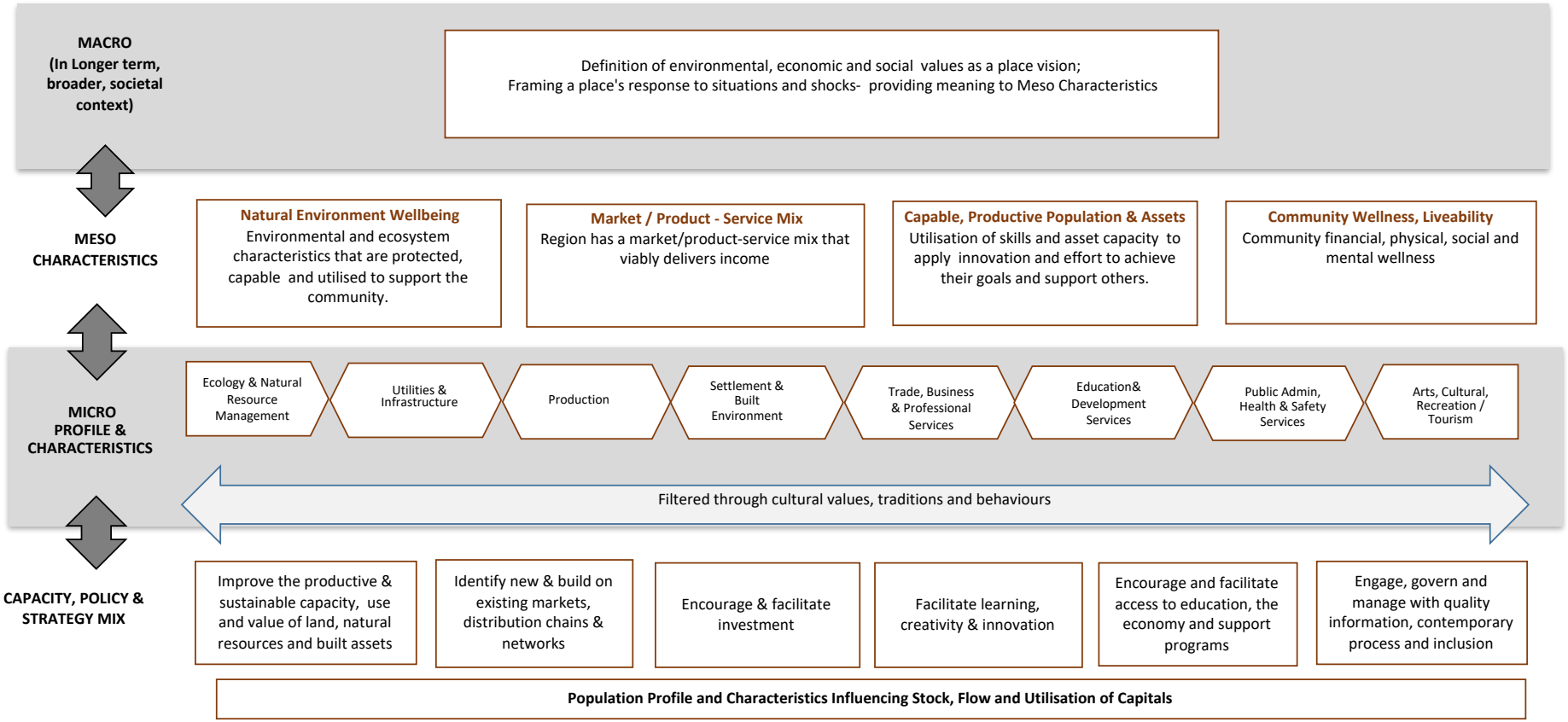
design. These include aspects of power, openness, education, innovation & entrepreneurship.

Direct and lagged, cause, effect connections and relationships are represented in the vertical dimension, typical of the linear approaches and reflect the principles of program logic and the strategy map (Kaplan & Norton, 2000). In this model, the term "dimension" relates to the micro to meta progression and relationship, while "perspective" is used as the means to introduce environmental, economic and social themes and elements.

The addition of the horizontal, "perspectives" transforms the linear into a system, allowing vertical, horizontal and omni-directional relationships to be identified and used to create a more realistic representation of the context, development of scenarios and the utility of a variety of policy and strategy interventions.

The framework when transformed into this regional/rural context, provides a representation that enables understanding of how a place or region works as a broader system and in particular the relationship between changes at the micro level flow through to meso and macro dimensions (Batie, 2008). The macro-meso dimensions represent the strategic, while the micro-interventions the operational and practice dimensions, creating a means of structured connection between the two.

Figure 3.1. Place-based Meta-framework – General Form



The representation is designed to include the building blocks (Ostrom, 1999) to facilitate enactment of two schools of thought on regional development and associated dynamics:

- Top down; and
- Bottom up and extend this to enable an integrated, systemic application of both.

The top down approach is premised on alignment of small area, local development based on national policy settings, both as "trickle down" effect or as an active intervention, for agglomeration and creation of clusters. Bottom up perspective have tended to focus on support to new business creation and/or specific sector development initiatives where the sector is identified as having development potential or is "worthy" of support. Both policy approaches are dynamic; introducing a change to create a consequence, the meta-framework enables to cause-effect flows to be tracked and visually represented to complement quantitative representation of the interdependencies. Systemic approaches promote the combination of the approaches to create new, conjoint options to emerge.

Populating the system elements with data provides a representation of the structure of a place that has a factual, numeric basis to it. These data, when applied to the meta-framework can reflect current condition, changes over time, actual to expectations and direction of change, a flexibility in data presentation to match the policy interest. Dynamics become evident across the range of perspectives and dimensions that represent place, inclusion across the scope of elements has a range of benefits. The meta-framework addresses Arthur's (Arthur, 2013) focus of bringing at times forgotten, relegated or ignored but important perspectives and connections to the forefront of analysis and discourse. In the above representation the capitals that Arthurs views as the key formative elements to an economy and also from a triple bottom line perspective the specific inclusion of both ecological and well-being perspectives serves to introduce the question of balancing the perspectives.

The question of balance draws attention to the influence of values, tradition and practice that frames societal, institutional, household and individual decisions and behaviours; this intangible connection is an overlay connection of overt and inherent bias towards or against specific perspectives, positions and interventions.

The meta-framework enables the intersection of values, interests and influence of key players within the system to be mapped against other technical elements. This enables a practical inclusion of the cultural perspective as an important overlay on the system. This overlay helps to understand endogeneity and response to exogenous connections received as direct, tangible impacts and signals at the meso and micro levels. Examples include the impact of community values on participation in and education attainment, specific industry and project feasibility and the incidence of new business providing indicators of the cultural perspective and of the differences between places in their associated activity profile. These micro-dimension indicators of contestability are mirrored at the meso dimension in the priorities attributed in a place to Triple Bottom Line perspectives.

As noted, the economic perspective of the Triple Bottom Line within this meta-framework is deconstructed to reflect both economic performance in the market and productive use of capitals. This is motivated by the conjoint nature of the ecology and economy as inputs into well-being; a construct partially identified in sustainable livelihoods (Scoones, 2009) and but as identified (Elkington, 2018) as a Triple Bottom Line requires some re-thinking as a mechanism to achieve balance as the basis for sustainability and arguably resilience. The structure of the meso dimension is designed to develop a stronger focus on:

- The productive utilisation of the place's stock of capitals, the formative aspects of the economy (Arthur, 2013), including those that are latent through neglect or, for example because of cultural traditions and instruments such as retirement; and
- Well-being as the "end game" (Dalziel, et al., 2018) as a sustainable response to environmental degradation, climate change, poverty, providing a counter- balance to GDP growth and related metrics as the measures of success of a place, increasing the focus on individual and collective capabilities as the determinants of achieving a state of wellbeing.

These perspectives draw attention to the importance of including the TBL scope within outcomes at the place construct and establishing a discourse to facilitate consideration of such principles.

The meta-framework provides a descriptive representation of complexity, it makes tangible, internal connections visible while providing a map on which to overlay intangible perspectives that reside within and influence the system and to identify the impact of actions a signal from outside the system

The subsequent challenge to a descriptive representation of what is happening is that of why; developing an understanding of the interdependency of socio-technical connections and how the system receives and responds to signals propagating through the system in both tangible and intangible forms.

Understanding Complexity

Representing the micro dimension supports description, recognition and understanding of the structure and interdependencies of place and people as a system and the dynamic patterns in play. The meta-framework provides a representation to support the productive use and combination of qualitative and quantitative models and tools to help understand complexity.

The meta-framework informs the specific analytical techniques that are most suitable to test explanatory questions or hypotheses. As a thinking frame it is designed to provide a tool to support inclusion of multiple perspectives in discussion and emergence of contextual understanding of cause/effect and of patterns of change. These discussions frame the scope and depth of formal analysis that matches the complexity and risk inherent in the policy theme. It provides for a three stage approach:

- Initial qualitative analysis, often combined with available statistics;
- Further detailed analysis; and

- Further discovery and meaning by combining the quantitative and qualitative.

The initial challenge is to develop an understanding of how a place works, its interdependencies, and why it works in that manner: the "how" tending to be the focus of traditional analysis through statistical profiling, trend analysis and input/output and econometric modelling; the micro-dimension is the predominant focus within traditional approaches. The input/outcome relationships between a change in one sector and the direct and in-direct flow-on employment and income to others though a change in activity, framed as a value of output change, is extensively utilised and provides indicative impacts from proposed interventions. These models capture and quantify the connections and dynamic relationships between models based on historical relationships and do not capture recent disruption effectively. Technical disruption alters the supply chains on which the relationships are based, altering production functions that capture the labour (and its characteristics), capital and material inputs into production, once known, they can be estimated to adjust the interdependencies – they are visible within the supply side of the economy.

These economic models have become default or standardised analyses in capturing both the micro dynamics and through benefit-cost analysis (BCA) that predominantly uses changes in employment and income as consequence of investment as proxies for social for social benefit. The techniques are primarily positioned as economic models, within which ecological and social factors are transformed to fit.

Over-weighted focus on the micro level creates a risk of failing to connect the micro to the meso or macro objectives that frame the medium to longer term objectives. The meta-framework makes this connection to support understanding of how changes at the micro dimension impact economic performance/productivity, generate improves wellness and protect the ecology. In addition, the need to understand the relationship between the TBL outcomes is essential, for example an ecological change may have a greater impact on primary production than a change in material input factors.

This highlights the role of a dynamic systems meta-framework in identifying multiple pathways to a change at the meso dimension:

- A direct flow-on from a capital intervention into an activity that flows into an outcome improvement – the typical linear relationship;
- An in-direct flow-on from one outcome perspective to another through an alternate intervention.

The measures at this meso dimension provide the basis for understanding the benefit-cost relationship for alternate policy and strategy intervention based on multiple perspectives that share a meso dimension condition goal. Understanding the potential of these alternates as valid system interventions is arguably important to effective policy outcomes and resource allocation efficiency.

In a policy context, understanding these interdependencies is key to making policy within the system context, including for each element:

- Current condition - cause and consequence;
- Required condition – consequence and cause; and
- Potential system impact of policy intervention.

These queries have omni directional responses, however the horizontal and vertical responses, together with the cultural overlay are the commencement point to understanding,

- The interdependencies along the representations of the macro and micro dimension progressions and why the interdependence exists;
- The dependence of elements in the micro dimension its access to and use of available capitals; and
- The relationships between the micro and macro dimensions and the dependence of macro characteristics on micro dimension process and outputs.

The processes and tools used in conjunction with the meta-framework provide the socio-technical explanatory variables relating to the core policy theme and to address related contention that is ubiquitous in the policy making system. The understanding derived from developing this within the meta-framework architecture is that the focus and dynamics of contention are recognised and addressed with deeper understanding.

The definition of required condition and the framing of how capitals are utilised is culturally dependent. Driven from the societal values, priorities and practices that determine required condition and importance at the macro dimension, these determine how the ecological, economic and social perspectives are described and balanced. Cultural factors also frame which forms of intervention and capitals are utilised; influencing both "what is sought" and "how it is progressed" creating a link to leadership and political dimensions within policy making. The manner in which leadership, politics and analysis combine, or need to combine, is not resolved by the meta-framework; however, it provides a tool to bring the perspectives forward within logic based narratives and discourse.

Explaining Complexity

The "too complex" conclusion was attached to the sustainable livelihoods approach (Scoones, 2009). It reflects a significant challenge in establishing a meaningful progression from reductionist, linear approaches to some form of "systems" representation in policy making and implementation. As has been noted, dynamic systems logic, represented as a meta-framework is considered as a framework within which to apply the approaches identified in Chapter Two, it is also considered a frame for meaningful place-based narratives and discourse.

The meta-framework includes:

- A scope of elements that reflect key dimensions and the multiple perspectives of place and the of people engaging to achieve their joint, individual and intergenerational quality of life objectives;
- A focus logic to the connections between inputs and outcomes and elements in the short, medium and longer term;
- Data to provide both a tangible explanation, demonstration and evidence.

The combination of focus, scope, logic and data provides the basis for explanation and conversation during policy development and in promoting policy development as a component of its testing and implementation.

The meta-frame-work is designed to support narratives and to provide a reference point comprising information and meaning

Government policy interventions focus on a contribution to the stock and application of capitals, for example investment in infrastructure, education, health service or the formation of industry clusters all impact the stock of community capitals able to be applied to both households and sectors. In effect community capitals provide both the stock of inputs, the factors of production and the process/instruments that the region has to transform into outputs.

The meta-framework is a heuristic; providing a flexible systems dynamic architecture that is a means of two representing, understanding and explaining complexity in a manner it can be practically utilised to develop policy from the application of a range of tools and approaches that while recognising the potential of connections and complexity were applied as adjuncts to traditional approaches.

Utilising the Framework

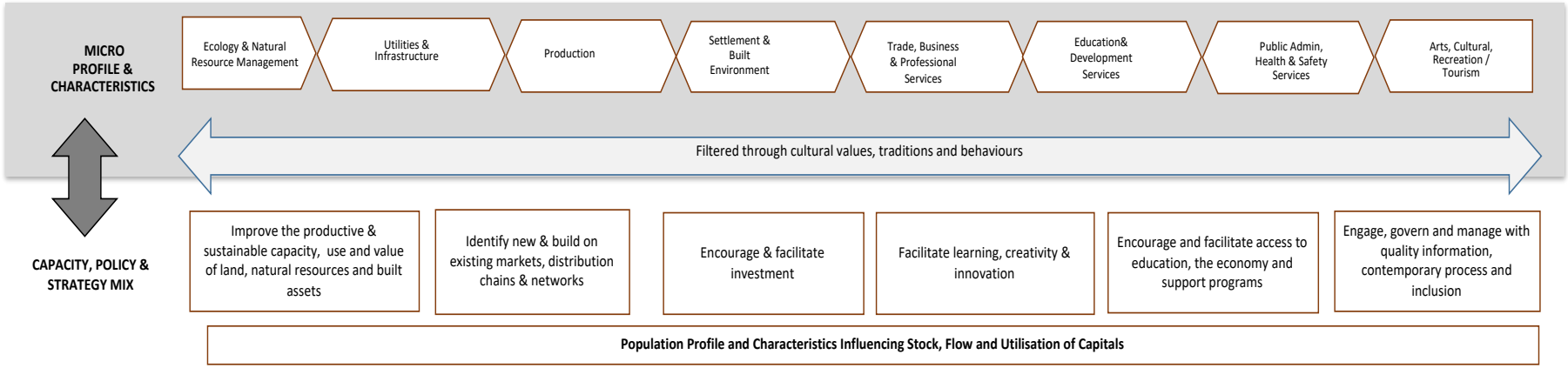
On-ground practice, analysis and understanding what's happening on the ground

The micro dimension provides the link between people, their activity and application of capitals as the basis for the way a place works on a day to day basis; the short run perspective, it is the dimension that directly connects people to activity and short term results. Activities within places have traditionally been categorised into interdependent industry sectors, with enterprises, institutions and people playing a role within them to deliver commercial and community value; providing the basis for livelihoods, quality of life and society, factors which have both short and long run dimensions. The micro dimension focuses on the short run but is affected by formative factors (Arthur, 2013) and capitals that have developed over long periods and by shocks that emerge from both internal and external sources. An understanding of the micro dimension of a place what has and continues to influence its current condition and future prospects is the essential starting point to point to the making of development policy and strategy in a place. The practical importance of this

dimension is the inclusion and characteristics of the universal components of structured, repetitive interaction identified by Ostrom; participants, positions, actions, transformation functions linking actions to outcomes, information and payoffs along with their multiple values leading to an "incredible" variety of action situations (Ostrom, 1999) which policy intervention can potentially influence.

Represented in the shaded row within Fig 3.2 below, sectoral interdependence within a place is long recognised, the modelling of these relationships continues to be a major tool in sector development and private/public investment through benefit-cost analysis supported informed by the direct and multiplier impact determined through the application of place specific computable general equilibrium models.

Figure 3.2. Place-based Meta-framework – Micro Dimension & Formative Factors



The structure enables the connections and specific sectoral characteristics and interventions interdependencies to be identified. For example. That an intervention in one sector generates both direct change in it and a consequent flow-on into others, is one form of economic analysis captured in forms of input/output (IO) analysis. The use of input/output thinking derived from the transactions that occur between sectors and associated computable general equilibrium models for specific places (Varga, 2015) enables quantification of direct, flow-on and indirect benefits in terms of both income and employment multipliers across the above value chain. The ability to construct a model to reflect a specific place enables the impact of the social and technical structure as it affects the interdependencies within the place's economy to be factored in, provides a robust analytical capability at the micro dimension.

This form of analysis identifies direct and induced economic benefit. Within the suite of impacts calculated it uses employment and income to capture economic impact and as a proxy for social benefit; but while this relationship is established in use, these variables are not the sole determinants or measures of welfare. Wider social and environmental benefits and costs tend to be appended to the economic analysis as a qualitative analysis because of the challenges of quantifying such impact. The lack of recognition and both positive and negative values of transactions with *the environment* and the broader flow-on effects to people is an important constraint and results in limited value in their application (Arthur, 2013) (Batie, 2008). However, the application of the indirect and second round multiplier effects of changes to expenditure and output in one sector to others in terms of both wages and employment has promoted benefit-cost analysis to a key modelling tool. Benefit-cost analysis has value in comparing the relative impacts of investment options and in understanding "shocks on a regional economy. These benefit-cost analyses have broadened their scope to include social and environmental factors (Infrastructure Australia, 2018)

Less used as a systemic characteristic of place are community capitals and their explicit role in delivering capability to activities and their role in beneficial change to the focus, performance and productivity of the profile and the enablers of policy and strategy options. This interaction is framed by the natural, constructed and intangible capitals that provide the place's absolute and comparative resource base and technological application as factors of production. The stock and flow of community capitals at the regional, sectoral and household levels provide the place's capacity to act, collaborate, seek opportunities, meet challenges and achieve the resilience to adapt to shocks (Emery & Flora, 2006). These capitals have been used as the basis for the design of the "Capacity, Policy and Strategy Mix" in Fig 3. 2 above and reflect the formative elements of an economy (Arthur, 2013) , community and society.

The capitals are an integral component the characteristics of populations, individually and collectively, in the determining and analysing the profile and their contribution and the performance of their societal structures and mechanisms that are a reflection of their culture, values and practices. Their intersection with activities demonstrating the source of performance and productivity, the factors of current production and future productive

capacity. The measurement of stocks of these capitals or the determination of the application and impact of these capitals does not form part of any long term and structured set of data but are the foundations of current performance and future resilience. When stocks are described they, they tend to be framed is a specific issue context, for example education or the relationship between education and levels of employment opportunities; not as an element of a place-based system. This lack of emphasis on the formative factors, including community capitals and outcomes is highlighted in complexity economics (Arthur, 2013) and in concerns that traditional analytical models do not match the need for information on which to make effective policy decisions (Batie, 2008).

The variation across these structural and capital perspectives between places provides insight into their relative leading or lagging in relative performance across national and transnational scales. This diversity highlights the variation within key connections, interactions and dynamics, the connection of community capital to activities as the formation and diversity of a society and an economy (Arthur, 2013). Practice at the micro dimension and the activity/capitals mix on which it is based, is both a technical and social construct that frames current performance and capability. It represents a "place culture" which can sit, for example on a scale extending from highly open and innovative to conversely highly closed and traditional. The cultural overlay to a place provides a filter to signals and frames response to those signals; signals can be not seen, received, ignored or subsequently activated in a manner reflective of cultural values, traditions and practice. Within the meta-framework approach, the cultural overlay is a means of identifying indicators that help discern causality not technically determined from other factors of place formation and performance. This include, for example:

- Education participation and attainment;
- Business commencement;
- Employment by business size;
- Workforce gender and role.

While these indicators are included within standard place profiles as components of the economy, they, along with others that are contextually relevant, also provide a signal on cultural propensity to pursue specific policy/strategy mixes and equally importantly to the framing of the definition of and balance between the meso dimension outcomes.

This micro-economic focus brings together input and outputs through process; it is short run in its focus. The meta-framework augments and, provides a visual means of representing what has evolved in standards economic profiling utilising data from the Australian Bureau of Statistics (ABS), other government agencies and research institution reports and data sets, to develop focuses representation of conditions, trends and trajectories. This expands the scope of information to include health, education and ecological data and research information. Data reflective of the underpinning community capitals is derived from ABS census and other sets derived from these and periodic research projects, these include comparative indices, such as the Socio-economic Index for Australia (SEIFA). These data can be further utilised within econometric modelling to support the understanding of determinants to condition and the impact of shocks to the performance of a place; the meta-framework uniquely provides a

visual contribution as a visual scorecard method to provide comparative, trend and benchmarking information. These data and their application in the place context reinforce the multi-perspective nature of place as a development construct, a characteristic captured in the meta-framework.

The micro analysis provides only a part picture, of on-ground condition. The data sets identified above, also provide a range of outcome indicators consistent with the outcomes included in the meso/macro dimension of the meta-framework, their conditions and trajectories

- Ecological;
- Market/Product mix;
- Productivity; and
- Wellbeing

This evolution of the triple bottom line and its inclusion within the meso dimension and the medium term measures of a place's success places the TBL perspectives and their balance/interdependencies as strategic drivers of policy and activity, not as a consequential measure determined after activities have been accounted for (Elkington, 2018).

The strategic dimension in place

At the national government level, macro policies take a range of forms, including taxation, monetary, and industrial relations, each of which, independently or collectively, are aimed at achieving aggregate results. The place-based impact of these governance interventions is targeted at achievement of some change in condition in terms of outputs, employment, or income; at times targeted at some enduring positive impact on the stock of community capitals to support future capacity and resilience.

At the micro dimension, the impact of macro policies occurs via their translation into investment in programs and projects by public, private and civic entities or by enterprises altering their production function by, for example employing additional staff, investing in new capital equipment or increasing their marketing; these changes can, if identified, also be captured in the economic models. The challenge at this level is to also adapt the traditional models to reflect the changes in the production functions and the profile of transactions between sectors, for example changes in the application of new technology takes time for the impact to be identified within the models.

At a sub-national place dimension, the success of macro policy is reflected as changes in both outputs and outcomes; the lagged consequences of individual and interdependent activities; however, the primary data collection mechanisms are output focused. At the place dimension, the meso/macro perspective reflect strategic condition and intent, the medium and longer-term goals, or outcomes sought by society in that place.

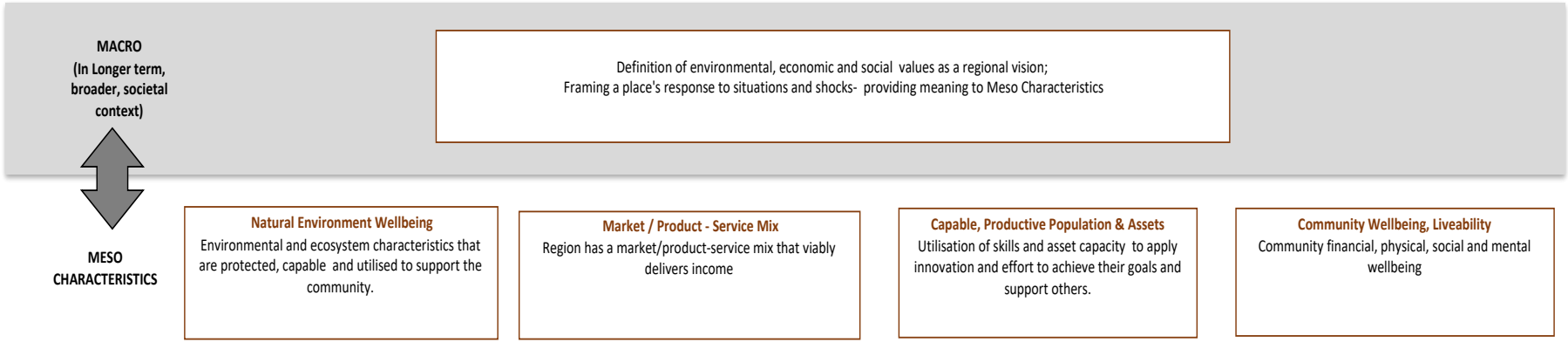
Outcomes are the flow-on effect of a change in outputs, the flow-on impacts or external effects on the community as a result of producing specific change in outputs (OECD, 1994). This dimension is a medium term consequence of development policy decisions impacting the

micro dimension and in an aggregate sense within the place flowing through to impact the community, this can be identified as a change of condition in, for example economic circumstances, wellbeing and/or capacity to address challenges or identify and achieve opportunities. The transition of the OECD New Rural Paradigm to OECD Rural Policy 3.0 places "wellbeing", an outcome dependent upon micro dimension determinants at the forefront (OECD, 2018).

The transition to place-based regional development, in accordance with the new paradigm construct introduces a mirroring focus on outcomes, the meso dimension of regional development. The transition to endogenous generated development, within the context influenced by the connection of the region to outside place and exogenous influences, introduces the definition of outcomes that are also endogenously defined. The process of endogenous development, as opposed to adopting or at least collaborating to support, outcomes defined by superior government introduces the "dynamic, connected and contested" characteristics central to this thesis.

The strategic perspective is established through the medium to longer term dimensions defined at the macro and meso dimensions of the meta-framework, represented in Figure 3.3. below.

Figure 3.3. Place-based Meta-framework – Strategic Dimensions



These dimensions are informed by the same qualitative information and quantitative data sets used to analyse the place profile, but with indicators that reflect condition, some reflective of the stock of community capitals. This introduces the strategic context into place-based development, specifically, what outcomes are valued by the society within the region, and importantly what is their relative importance and priority?

The "triple bottom line" (TBL) has formed a basis for the consideration and explanation of the importance of multiple perspectives. In a place context, the outcomes are interdependent, combining to deliver the "vision" of society within the region, a sense of place, identity a broad, longer term "macro-perspective and how it can be achieved through the outcomes. At this place-based orientation, the macro attributes differ from the core economic, e.g. national productivity or socio-economic e.g. housing cost perspectives that are the focus of national governments; at a place, they take on and consolidate a broader perspective that is immediate and pervasive in making the place liveable and sustainable.

As noted, the outcomes at this meso dimension are a medium to long run consequence of how the place works; how it performs, how productive it is, its capital stock and how it responds to externalities across multiple perspectives simultaneously. The definition of these outcomes at the meso dimension is a function of the values, interests and societal structure and mechanisms that form the social and cultural perspective of place identified above and informed by analysis such as identified above.

The multiple perspectives of meta-framework approach are framed through community research and work-shop models of participation in consideration of the meso and macro dimensions, their objectives and relationships. These are designed to include valid cross-sections within surveys, depth interview and working sessions to ensure multiple perspectives are included.

The value principles and specific definitions and measures for each perspective provide reference points on which to both establish policy and strategy and to evaluate outcomes. The TBL construct is well recognised, while on a "one by one" basis participants tend to be able to reach agreement however when considering the interdependence between them, their relative balance and dominance of "trade-off" inherent in binary, zero sum transactions thinking brings value and interest contests to the fore. The "re-think" of the Triple Bottom Line (Elkington, 2018) as a complementary and interdependent set of outcomes, potentially combining to create value across all dimensions.

Place-based approaches crystallise the tensions and contests in a way that traditional reductionist and silo models do not, until the tension escalates. Again, the meta-framework does not provide a solution, but does provide a structure to consider balance as both a goal and in setting short term parameters; factors requiring complementary balance in leadership, consensus and legitimacy in adopting dynamic, recursive models in arenas that represent unresolved contest.

This recursive structure requires a micro to meso enabled by leadership, governance and support processes (Horlings, et al., 2018) with a focus on outcomes, institutions and instruments which to simultaneously manage the day to day and strategic. To achieve this necessitates a strong understanding of the cause/effect connections, dynamics and consequences of decisions to intervene (or not) with which of the options available.

The connection between macro and micro dimensions within a place development frame provides purpose and importantly a connection to broader societal, state and national perspectives.

The meta-framework makes these connections transparent and approaches the connection in the following way.

Connecting Strategy and Practice

Within the meta-framework architecture as proposed; the dimensions reflect a different focus within the logic progression; from a practical policy perspective:

- The macro dimension reflects the medium to longer term quality of life perspectives (Torgeson, 1986);
- While the micro perspective is reflective of short-term livelihoods (Scoones, 2009).

As noted by Scoones, the connection and at times tension between the two dimensions is important and also assists to integrate the politics to policy practice of "alternating forward to backward mapping", identified by Hoppe (Hoppe, 2018) as a means of identifying and connecting the priorities of politicians with and to the implementers perspectives.

From a traditional regional/rural development perspective, connecting the micro to the macro is a significant challenge in regional development (Cooke, 2012) (Bamberger, 2008). It is a two-way relationship:

- How is a macro policy implemented or issue addressed at the micro dimension; and
- How does a micro change positively impact a macro objective?

They are questions framed around understanding of where interventions intersect with sectors, or population segments, to achieve optimum direct and flow-on outcomes.

In the context of this thesis and the new paradigm and place-based context, this relates to the performance of the micro dimension in relation to achieving the outcomes identified as important by the community within the place and in the "top down" context of macro policy implementation. Macro policy factors such as improving Total Factor Productivity across a nation are an example of an outcome, classified as "macro" because of its broad importance across the national economy as a whole, whereas within a place, an outcome is the lagged consequence of a change in output(s) as described in table 2. .

As discussed above, the definition of outcomes at the place level, can be contested in relation to:

- The specific measures and targets associated with and selected for each outcome perspective;
- The relative weightings of the perspectives, and therefore priority; and
- The intervention mix and investment levels that provide "best" outcomes.

Definition of key outcomes for each perspective provides the context for considering the role and contribution of the sectors, households and institutions in delivering these outcomes; enabling the analysis and confirmation of the contribution of activity and the results of that activity to the quality of life experienced in the place as defined as specific outcome targets, identified as reflective of values and priorities. Using the meta-framework as a development frame, contribution mapping is a phase designed identify how the micro element contributes to the outcomes sought.

Within this meta-framework construct, this mapping takes the form of a simple matrix to consolidate the conclusions and agreement of stakeholders.

Figure 3.4. Contribution Table – General Form

CONTRIBUTION TABLE (+VE & -VE)				
	MESO - OUTCOMES			
	Natural Environment Wellbeing	Market / Product - Service Mix	Productive Population & Assets	Community Wellbeing, Liveability
MICRO - ACTIVITIES	Environmental and ecosystem characteritics that are protected and utilised to support the community.	Region has a market/product-service mix that viably delivers income	Utilisation of skills and assets to apply innovation and effort to achieve their goals and support others.	Community financial, physical, social and mental wellbeing
Ecology & Natural Resource Management				
Utilities & Infrastructure				
Production				
Settlement & Built Environment				
Trade, Business & Professsional Services				
Education Services				
Public Admin, Health & Safety Services				
Arts, Cultural, Recreation / Tourism				
Households				
Mechanisms & Institutions				

The matrix is completed by stakeholders participating in multi-perspective workshop process. It provides the basis on which to identify the incidence and degree of multiple and dispersed causality (Martin & Sunley, 2015) of changes to outcomes. This also develops the consideration of "conjoint" development, for example a mix of infrastructure and education to support production in achieving a specific market/product mix.

The second question relates to the impact if the micro element was changed to better contribute to then create a context for design of interventions. This process identifies a gap between the current condition or characteristics of a sector and that sought from policy and strategy interventions.

There are two dimensions considered in this analysis:

1. The current state;
2. A necessary or required/target state in the sector, households or institutions.

The matrix is populated with a mix of qualitative and quantitative input. In effect the table enables a correlation between the factors that combine to create "condition" in a micro element and their impact on the meso dimension and the factors that are the "performance measures" at this outcome dimension.

The above table, utilising data and stakeholder input, modelling and a combination of the two, is designed to:

1. Frame a description of the contribution made by sectors to the outcomes sought at the meso level; and
2. Form a view of the relative contribution.

This analysis encompasses consideration that is broader, deeper and complementary to micro dimension models that utilise transaction tables and the subsequent input out analyses and derivations such as computerised general equilibrium (CGE) models; the table representation creates a link between the micro and meso; the outputs to outcomes links that are defined in terms applicable to the place. Importantly this structure accommodates inclusion of negative and positive relationships. Importantly the table sits at a level where people can apply their experience and observations in a way that is difficult in the input/output and multiplier methodologies that dominate micro analysis.

The flexibility of the representation as either descriptive or represented as correlations between key output and outcome variables as absolute or composite measures. Absolute measures do not necessarily reflect the importance of a piece of information, nor does a piece of information in isolation assist in understanding or explanation.

The above table provides an "overview" of the place providing a picture of what the results of day to day practice do and could contribute to the outcomes sought. As a subsidiary analysis, the sectors can be disaggregated to provide more detail and ease of identifying specific action.

The contribution map correlates condition of a sector to the outcomes sought, it does not, explicitly, identify how that condition might change to enhance contribution. This is the role of the policy and strategy options that are used to design a mix of interventions at the activity level to achieve the change considered essential from the contribution mapping process.

The macro dimension frames the strategic context to place, but also has a key role in connecting place-based models to other levels of governance and societal trends.

Policy and Strategy Options

Government has a range of policy and strategy options open to it, arguably some are observed and traditional others less evident but discoverable, as either stand-alone interventions or in combination, to transition to preferred outcomes. Many of these options work most effectively when pursued with other levels of government, the private and community sectors. It is important to also note that the broader macro environment, or the on-ground characteristic may mean that particular strategies may not be available or need to play a different role than they may in other places and associated contexts. The intervention is a function of the application of capitals and the local context. The policy options are based on:

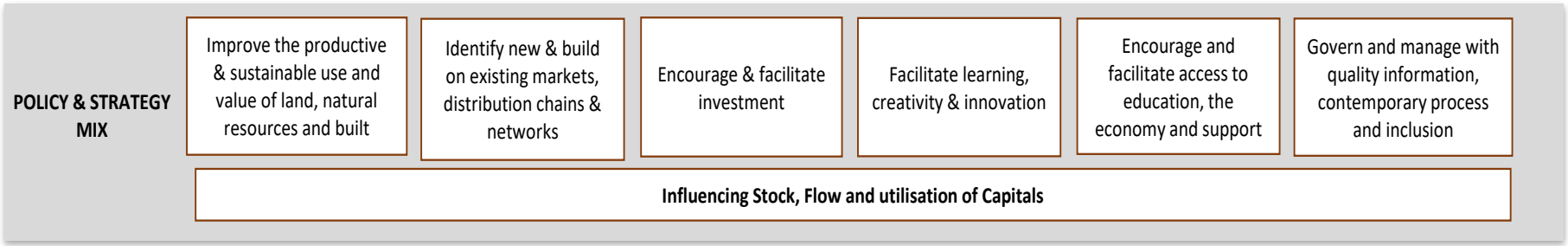
- Investing capitals stock to achieve some short term result and further flow-on; and
- Investing in capitals to achieve a future benefit.

The four outcome perspectives at the meso dimension are designed to articulate a tangible typology on which analyse and identify the capacity of the micro dimensions of a region to deliver those outcomes. The meso dimensions of the framework also reflect the effectiveness with which the region engages with other places and how effective the place is as a "system" comprising both external engagement and internal capacity and productivity to deliver outcomes and the potential of that capacity in the longer run, including its capability to drive and respond to endogenous and exogenous trends and shocks.

The application of the framework to a region or other representation of place, is a response to the contemporary dynamic, connected and contested realities earlier described and to mitigate "faddism" exemplified in waves of economic development strategies and associated techniques (Johnson, 2007) that emerge, are utilised as 'the answer" and are then abandoned to new fads. The systems framework is offered as a means of combining such strategies in whole or part in a manner that reflects the development context. This notion of integration in response is further developed in the concept of "collective efficacy" (McDonald, et al., 2013) and the role of social networks and partnerships, from diverse sources, in developing collective efficacy and political capital to facilitate and integrated response to rural decline. The ability to mix stakeholders, values and techniques in a contextual socio-technical response is enabled by the framework.

The policy and strategy intervention mix described in Fig. 3.5 below draws influence from the community capitals as an analytical and design frame (Emery & Flora, 2006), utilised to design interventions "the identification of assets in each capital (stock), the types of capital invested (flow), the interaction among capitals and the resulting impacts across capitals" (Emery & Flora, 2006) providing a focus on assets and investment as a consequence the options identified below reflect one set of development policy and strategy options that can be used, mixed and matched to develop a focused, effective and productive intervention by government and its partners who share similar outcomes and goals, the challenge is to determine which levers will change which stocks and which flows (Berkes & Ross, 2013).

Figure 3.5 – The Regional Development Intervention Profile



Critically, the manner in which the following strategies are implemented relate to both achievement of outcomes and in building community capital.

Improve the beneficial, productive & sustainable use and value of land, natural resources and built assets

Much of government effort is focused on a mix of regulating and investing in a place, the two being interdependent through the provision of a regulatory landscape that facilitates private investment in labour and capital while protecting other key values.

Land use management has both a private and public good perspective with a focus on natural and built capital and their interrelationships and interdependencies. The value of land, as reflected in its commercial return, is important for the community; land is a major source of community wealth and a driver of income.

This option has critical strategic dimensions, the intervention is critical; for example, to contribute to growth in the primary sector through best value agricultural land use, a strategy in which government and the primary industry sector can work together to consider how this land can be most productively used, products grown, value added and delivered to market in a viable manner could achieve great benefit. It has a focus on mix of natural and built capital and is largely about facilitating the environment within which investment can occur and benefit can flow, it is a key role of governments and of intergovernmental relations and transactions; it is also however, about creating a major interface between government, its community and the economy within a place

Government plays a significant role in this arena through recurrent and project activities such as:

- Planning scheme, zoning, clustering and structure plans;
- Ensuring services are available to appropriately zoned land;
- Natural Resource Management; and
- Promoting re-use of effluent and waste products to support intensive horticulture

Land use management highlights the convergence of place-based and traditional sectoral approaches to strategy and the potential tensions arising between different sectors and interests; this reinforces the critical value of the adaptive framework representation of both the place and the sector fit within that place to frame a multi-perspective and outcomes focused discourse as a central component of intervention design. This convergence also brings into focus 'social license" and the broad acceptability of development in the context of both broader and specific community and societal interests.

Identify new and build on existing markets & distribution networks

This market-oriented option is to a large degree the domain of the private sector, or in the positioning of a region as a "place defined product" with a brand that stands for key attributes and can be used by producers and as a mechanism to attract population and investment.

This strategy is about collaborating with and as appropriate supporting, existing industry and business groups to work together to contribute to the outcomes of the economic development framework; a critical combination of individual and joint activity and integration of the seven capitals inherent and able to be developed in a place.

The basis of this involvement, in recognition that this marketing arena is primarily for the private sector to take the major responsibility, is to identify whether there are examples of "market failure" where intervention/support can achieve a strong and wide benefit/cost return from council investment.

The application of this "thinking" to the community sector is similarly important, it is about understanding the segments of the community, their risks, and the opportunities that exist to work with existing groups and expand both scope and service mix to provide a better service a recognition of the importance of social and cultural capital in chains and networks.

This development intervention is about market/community demand, product and service design, positioning, value, supply and distribution chains.

Encourage and facilitate investment

The preceding options in the "tool box" play a part in attracting new investment by providing clear development rules, efficient processes, a strategic stance based on a defined future, they are all important in development of financial, built, human capital.

Public investment in hard infrastructure, services and development programs is equally important to private investment, the goal is to have them working together as is investment in built, human and social capital. The provision of clear strategic direction, a focus on outcomes and the ability to demonstrate the benefit/cost relationship of the investment is critical. Collaboration with industry and the community in progressing such investment is an important principle if the strategy is to generate returns to the community.

Facilitate learning, creativity and innovation

The development of human, cultural, social and intellectual capital is increasingly important to provide the foundations for participation in a contemporary society, both within the place and in connecting places in a manner that achieves mutual benefit.

As a key player, government can become a "boundary organisation" one that brings interests and groups together within a constructive, reflective framework that spans established boundaries to bring multiple perspectives to bear on traditional challenges, with the aim of applying different approaches to achieve a different result across the system. This can facilitate "whole of system" and more traditional functional or product based innovation.

Central to this is the creation of a narrative that engages people and organisations in a manner that encourages participation and reflection around the opportunities that are inherent for them, the contribution they can make and benefits they can receive. This extends boundary spanning into leadership within the system and influencing how strategies are implemented to achieve improvement in the stock of community capital.

Encourage and facilitate access to education, the economy and support

This option is focused on building connections between the various formal and informal structures within the community, social capital to ensure access to the capital foundations that will support their preferred future. While much of this occurs within specific purpose structures and networks some of these tend to work in isolation from others, consequently the mutual benefits are not jointly pursued, potential synergies and the innovation that often emerges from people from different areas working together does not occur.

Govern and manage with quality information, contemporary processes and inclusion

The regional framework is premised on this policy/strategy option being applied as the dominant governance model and within its associated instruments. The challenge is to place knowledge and evidence into context and create a coherent, compelling strategy that engages people in working towards outcomes. While this clearly relates to political capital, its aim is to place such governance as a platform for development of cultural capital.

Local government and its regional mechanisms tend not to have significant resources; consequently, it is necessary to apply these strategies to itself in implementing development initiatives. This reinforces the notion that government is just one, albeit significant, player, in development; the ability to harness key private, public and community resources to create a common, preferred future is considered a critical element and focus within the strategy mix.

Creating Value from Complexity

It is the effective implementation of well-focused policy that creates value, by creating new options to results and better utilising resources. These options derived from improved understanding of connections, dynamics and contestability that open up new arenas for collaboration and innovation across the system.

The first step described above in understanding where and how to intervene was to develop an understanding of how the activities within the regional profile, the micro dimension, contribute, or could improve their contribution if further developed, to the outcomes sought.

The output from the contribution mapping process was a summary of the current and required/target condition of the sectors, as specific sectors and jointly in the context of the balance of outcomes sought, this is an application of the potential for place driven innovation within and between sectors to achieve place benefit through transformation agency.

Defining the intervention objective at the place dimension occurs by including current and required/target condition for each activity element positions evaluation as part of the planning and implementation process provides a strong focus in initiative design and bundling, the two parts of the management process can be addressed as highly interdependent steps.

This provides a structure of a benefit-cost analysis determined from a clear articulation of the objectives sought from specific intervention and investment sets, the analysis able to be used to identify the relative merits of differing intervention mixes and levels of investment. The application of other econometric tools such as regression analysis provides a means of relating

the condition sought with the impact with the intervention on the production function. These relationships can be diagrammatically represented in a form that enable lay engagement and input through the use of "development pathway" constructs.

The following development pathways structure is derived and adapted from Scoones (Scoones, et al., 2007) and the socio-technical focus of the STEPS Centre development work. The representation is modified to facilitate multiple applications and ways of considering and utilising intersections between sector/population profile and the interventions. The inclusion of current and required condition highlights what is to be achieved, the "distance" from the current and reinforces the required condition link to the meso dimension outcomes.

The development pathways structure provides the connection between policy intervention, activity and results framing intervention planning, activity and evaluation in the short run. This phase dissembles the sector/population profile and intervention options from the map to create a matrix which frames the short run focus, operationalising policy and strategy.

This provides a short term spatial-temporal interactive matrix, providing the operationalization of the potential identified within the "contribution table" above. The micro focus in this instance brings together the intervention options with the sector and household structure that is represented in the place. It provides an action focus for the resources, institutions and relationships to co-design the interventions and actions that are contingent, relational, multi-layered; providing an indication of the degree of multiple and dispersed contribution, extending the causality mode identified in the EEG frame (Martin & Sunley, 2015).

Activities within the cells combine both specific output based activity and importantly the stock, flow and utilisation of community capital as a central component of place-based decision making and modelling (Varga, 2015). Connecting policy and strategy built from community capitals and connecting with day to day practice is a key step, facilitated through the development pathways.

As a planning tool it enables the placement of intervention mix to be identified. This is a mix of sector specific and conjoint application. The framework and the identification of intervention/sector intersection is designed to promote multiple benefits from intervention initiatives, considering how they can leverage further value across the place, rather than focusing on a single sector.

As with all of the base frameworks, the pathways provide a means to:

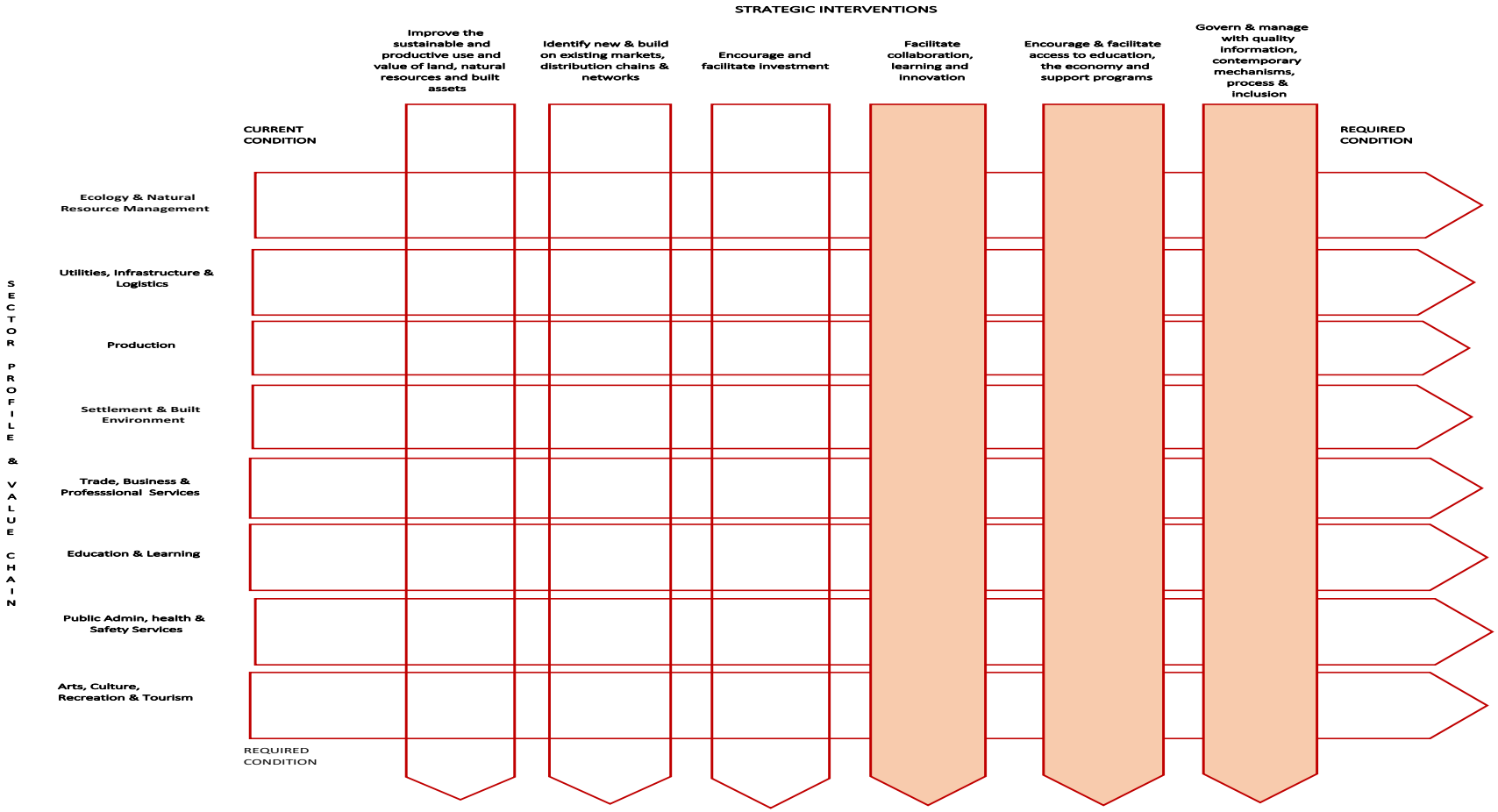
- Stimulate discussion and introduction of multiple perspectives;
- Focus necessary modelling;
- Generate focus and identify interventions;
- Identify who focuses where and how; and
- Provide a reporting structure.

This structural form, is an indicator of the combination of reductionist and systems approaches, allowing stakeholders to identify their specific roles and its complementarity and interdependence with, others within the systems context. The pathways format

provides the basis for understanding a "value system", as compare with the traditional notion of a value chain. This innovation construct is based on consideration of how a specific intervention focus can add value to a range of sectors and how sector value chains can be combined in new ways to alter the product-service scope and to improve productivity within these chains.

The following Table 3.6 is adapted from the STEPS Centre approach (Leach, et al., 2007) to reflect the approach and processes outlined in this research.

Figure 3.6 Development Pathways – General Form



The intersecting cells provide the basis to map responsibility and "what will be done by who" in the multi-relational and causality/impact structure identified above. This structure provides the opportunity for different players to understand how their focus complements that of others and contributes to the conditions sought. This helps support a relational perspective on place and the importance of networks and connectivity (Varro & Lagendijk, 2013).

The ability to identify dynamics such as the influence of interventions I the short term and over time highlights the need for adaption of intervention mixes over time and a dual focus, strategic and tactical. This is achieved by integrating these dimensions into a place-based, adaptive systems meta-framework.

Dynamic Systems Logic as a "Place-based System" framework

The meta-framework combines the strategic and day to day practice dimensions represented and described above and provides a general form of a "place-based" development meta-framework; a dynamic system and logic to represent place in a multi perspective and dimensional development context. The meta-framework enables consideration of the system as parts, and their subsequent re-integration into the systems to re-connect and test (Ostrom, 1999).

It integrates the input, output, outcome impact continuum of program logic and by defining the outcome dimension based on triple bottom line (Elkington, 1997) providing a "systems logic" meta-framework and model construct that allows for reflexive, adaptive regional development.

It assists to address key challenges identified in the evolution of thinking that led to the development and transition from old to new paradigm (OECD, 2009) and its Rural Policy 3.0 (OECD, 2018) application methodology, including key perspectives:

- Abstracting, framing and modelling spatial-temporal dynamics of economic performance growth at the micro dimension and meso, macro integration (Varga, 2015) (Martin & Sunley, 2015) (OECD, 2018);
- Transformative leadership linking public administration, everyday practices on the ground and knowledge support structures and relationships between these domains (Wellbrock, et al., 2013) (Olsson, et al., 2006);
- Economic evolution, robustness and plasticity (Martin & Sunley, 2015)
- The dynamics of time and space un-bound political-economic, socio-cultural and ecological structuring processes (Roep, et al., 2015); and
- Recognition of the transformative influence of structuring processes such as globalisation and the transformative agency of human actors shaping these places by meaningful conduct (Westley, et al., 2013)

These interconnected challenges are central to the "dynamic, connected and contested" context framing this thesis when located in the new paradigm, place-based context. In addition, the meta-framework architecture supports the use of concepts and tools such as the

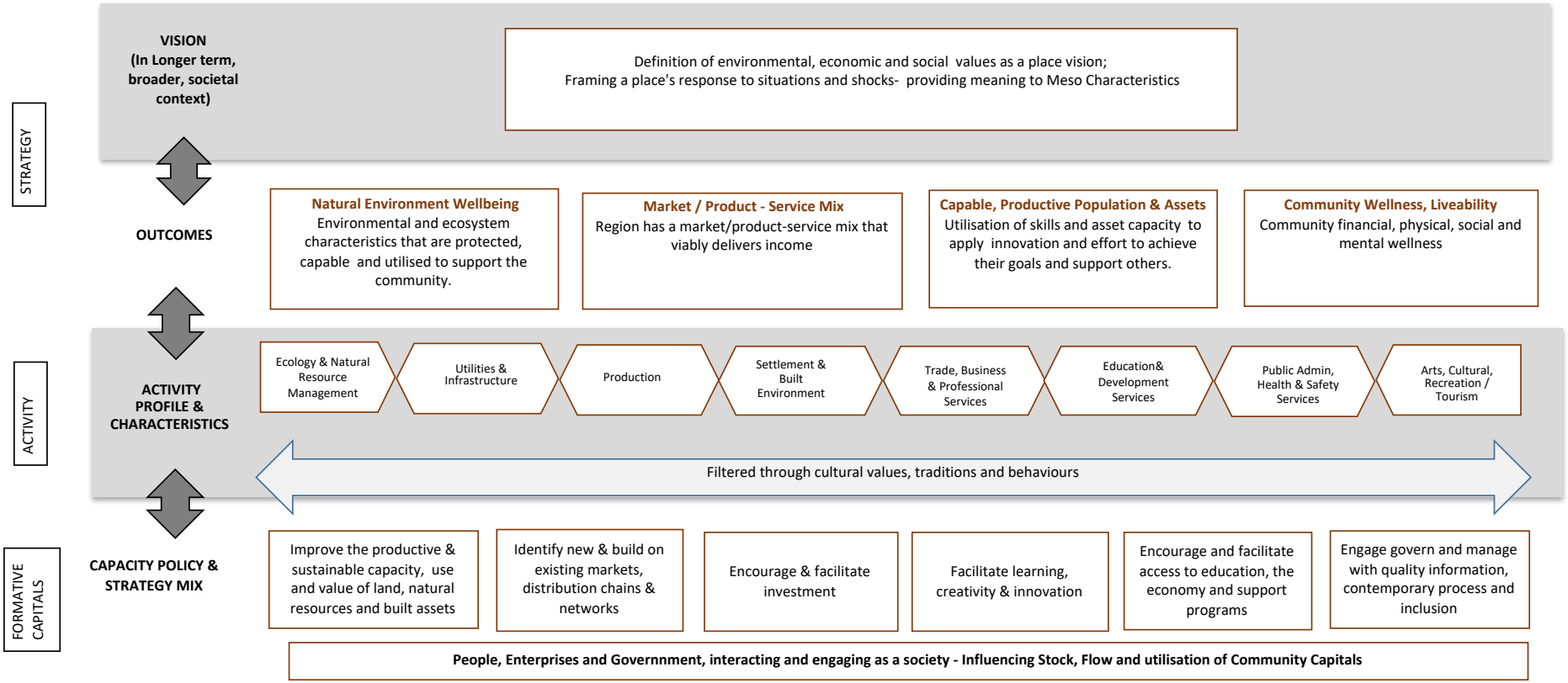
triple bottom line in context, rather than as adjuncts and potentially supports the longevity of other development approaches (Johnson, 2007) through structured integration into the system.

The meta-framework contributes to the need for *deep contextualisation* (Martin & Sunley, 2015) where evolutionary consideration includes the full set of entities, factors and influences; endogenous, exogenous, local and non-local; the structural and contingent that have conditioned and shaped the evolutionary dynamics and trajectory of the place. Martin indicates the requirement to accommodate "downward" to the micro and "upward" to take account of meso and macro circumstances and influences that constrain or facilitate certain development pathways and trajectories. Within this an outward perspective to consider the place's micro elements relationships with and dependencies on other systems, elsewhere.

This introduces the concept of related systems and sub-systems; leading to the concept of reciprocal and omni-directional causality both within the system as described below and between this and other systems; captured by consideration of where these endogenous and exogenous signals or shocks impact on the system and then propagate through the system in some pattern as a consequence of the learning and intentional behaviour characteristic of self-organisation within the system.

The meta-framework provides a tool to consider, understand and explain these challenges to enable a constructive positive response. The scope of the challenges is an indicator that scope of factors central to place-based development extends beyond those considered within the "old paradigm" and within space blind interventions. This raises the further challenge of establishing the role of traditional economic modelling within this context and in considered how key information is identified, sourced, ordered and utilised to support decisions and to test their efficacy.

Figure 3.7. Place-based Meta-framework – General Form



The meta-framework above is a general representation of the elements that make up a place, as identified above, providing a basis on which to identify and describe characteristics and condition with the micro to macro dimensions and associated perspectives that can be adapted to specific places.

It is a diagrammatic representation of the elements and relationships that make up a place that can be used to better understand and explain how it works as a self-organising system and contribute to its overall resilience, sustainability and liveability. It achieves this by providing a spatial-temporal base map that can be used to identify and consider:

- alternate, systemic and holistic ways of thinking about place and its future;
- critical spatial perspectives, their short medium and long term characteristics and the range of interventions available to enhance, manage or mitigate trends and shocks
- condition within the elements of the system from the multiple perspectives outlined above and to attribute value to that condition and its relative importance;
- interdependencies between elements and dimensions and the associated cause/effect implications of their relationships;
- likely impact of development interventions, issues and shocks and subsequent propagation through the system;
- co-design through potential scenarios arising from specific sets of interventions across the system; and
- environment shaping and an adaptive, strategic narrative to move towards a defined, multi-perspective preferred future state.

The framework is able to be populated by formal data and from observations; knowledge and experience of stakeholders to support analysis and understanding and explaining what is observed, engaging both specialist and lay knowledge input into the emerging description, understanding, explanations and narratives.

This enables both a temporal and intertemporal representation and description of place in both traditional statistical analysis and in diagrammatic forms. When used as a performance scorecard, the meta-framework supports the use of simple temporal representation of variation around targets for the elements as either discrete or composite variables for a specific period or if rates of change are utilised as the measure as an intertemporal representation. The diagrammatic representation of the system that underpins the place, provides a representation from which to identify patterns of change, historic, as a consequence of previous exogenous and endogenous shocks and interventions.

The meta-framework provides a platform to address the macro to micro link at the place scale and in the aggregate national context by translating national policy goals to a form relevant at the place scale at the meso and micro dimensions. At the micro dimension this link is arguably made in the process of enterprises translating development policy into strategy and projects and conversely developing insight into how sectors and enterprises translate "shocks" into strategy and projects, an initial cause/effect relationship. The translation is a

"management or administrative response" that introduces the social dimension into the quantitative demonstration of the cause/effect relationships, the why and how of the cause-effect. As with any ecosystem, signals are generated some from outside and others within the system, some observe and adapt, others either don't observe or decide not to adapt; not all signals, such as macro-policy actions transform all potential players and not all players in a particular place-based cohort become transformation agents; this is the foundation of the self-managing, innovative system. The why and how of this can be framed within the meta-framework structure and its earlier described tools.

The micro dimension has identified the scope and characteristics of societal structures and mechanisms, while some are sectoral based, others are "interest groups" coalescing around the environmental, economic and social perspectives included in the outcome perspectives As with a land map, the base layer can be overlaid to provide focus and clarity across many perspectives, including the intersection of these structures and mechanisms across the meta-framework; in addition to intersection, this enables the mapping of power, influence and leadership or blocking capacity. This assists in extending the essentially "technical" nature of the meta-framework into critical social, cultural and political perspectives; enabling different layers to be considered and combined to enhance realism as the basis for design of intervention "bundles".

The cause-effect relationship at the sector and community cohort levels is arguably influenced by the capitals derived from leadership, key institutions, networks, support processes, intellectual capital and other resources that have been applied to deliver growth, equity and resilience in the face of change. The meta-framework is not just a tool to help mitigate threat, it is a tool for the transformation agents, to identify the characteristics of a preferred future for the place and to work from the outcomes that reflect this through the micro-dimension to realise it. This commences the evolution of a "futures oriented, connected up" narrative as the basis for discourse with a central cause/effect positioning.

The mapping application occurs at informal and formal levels of consideration. The informal level involves "non-specialists", lay people who may be elected officials, business owners, community group representatives, community members reflecting a range of interests who provide input based on experience, observation and reflection. There is a rapid transition between identifying and agreeing on general condition and for inquiring participants to begin "what if" input into discussions in such forums.

These traditional approaches have utilised a range of economic modelling approaches and tools to evaluate impact, explain relationships and to validate investment. It is recognised that the transition to place-based development challenges the suitability and capacity of these modelling approaches and their capability (Varga, 2015).

The following section explores the application of modelling to the implementation of place-based principles as a regional development approach, the application of traditional modelling and the use of the dynamic systems meta-framework as a tool to frame analysis and modelling from a place perspective

Integrating Thinking and Modelling – Learning and Adapting or Predicting and Evaluating?

A model is a representation of "reality" that assists people to engage with, understand, adapt and utilise an idea, concept or reality in pursuit of an end. This thesis proffers that the policy environment that now exists requires a representation that reflects the dynamic, connected and contested characteristics within which they exist, rather than the reduced, linear forms that are reflected in administrative policy silos.

The premise of this thesis relates to how places and policy are developed, implemented and managed in an environment that is dynamic, connected and contested. An awareness that aspects of social and economic development are complex, unpredictable and ultimately uncontrollable (Archibald, et al., 2018) increasingly raises the need to transition from linear reductionist models to ones that are more dynamic, reflective and responsive.

Inherent in this is the concept that the knowledge and thinking should drive the modelling, in terms of focus and form. This raises the relevance and appropriateness of mathematical models that have been developed to define structural and operational relationships based on notions of independence proportionality, equilibrium, past transactions and causality relationships as an accurate predictor of future results and certainty.

The micro dimension has provided a strong focus for economic theory and modelling. The development of transaction tables (Leontief, 1986) that mapped financial flows between sectors and the resultant input/output modelling was designed to quantify the relationship between sectors and to model the effect of a change in one sector and the flow on to others based on specific assumptions. This form of modelling has developed strong understanding of the impact of the flow of transactions between the elements, however, limits in both measurement of impact and in scope have been identified. Computable General Equilibrium models a broad and sub-regional scale provide a strong understanding of the direct and flow-on effects of a change in output or employment in one sector on others within the place. These form the basis for broad benefit/cost analysis for public investment; their ability to quantify economic benefits, with an implied social return from wages and employment and are widely used to validate or compare investment. Introduction of Bayesian probability based models broadly facilitating an estimation of "the probability of A, given B" in single form and network applications is providing an alternate to econometric estimation, a prediction.

The micro dimension is also analysed through the use of standard econometric models based on time series or structural equations built around a specific economic dependent variable. These structural forms tend to be narrow in focus and reduced forms, comprising key variable; reductionist models. The known structural forms can be augmented with variables that reflect the introduction of a specific intervention as some form of value or "dummy variable" exhibiting a 'zero or one". The utilisation of "lags" helps identify the time lag between intervention and result. Panel data provides for the inclusion of structural forms across time dimensions; the modelling technique allowing the value of an explanatory variable to be

determined within the period and between periods. This is useful in determining the robustness of the contribution of an explanatory variable over time by comparing the value and significance tests. This form of analysis is also applied to macro policy, with national and transnational models comprising sets of structural equations.

The EU is deeply engaged in expanding their structural modelling sets and systems of equations to integrate geographic and micro constructs (Varga, 2015), examples include

The introduction of complexity and place paradigms challenge the use of "ordered models or systems" as tend to frame the linear, reductionist models that populate traditional econometrics. Mathematical modelling is not costless, nor necessarily timely given the periodic collection of key aggregate data that informs them. The capacity to provide a visual representation as a complement and guide to quantitative approaches is of potential value; the use of the meta-framework and the associated tools informs questions and the analysis designed to provide a response to the questions; helping drive productive analysis that can be connected to the qualitative.

Complementarity between the qualitative and quantitative provides value:

- The necessity to rigorously consider the measures that relate to the outcomes/condition sought provides enhanced clarity; and
- New data can provide new insights and understanding

The adaptive systems meta-framework is designed support the points above, to be utilised as a system and dissembled to support understanding at reductionist, partial level, the aim to then re-assemble the system and to develop further understanding of how change propagates through the system. This does not preclude exploratory analysis designed to identify if relationships other than those premised on observation, experience and traditional theoretical relationships also exist; this not limited to technical relationships but understanding, for example of cultural and social variation between and within places impacting the mix of interventions that will facilitate change.

Reductionism is a response to limiting the dimensions and perspectives being considered to a set of parameters that can "be dealt with", it is not necessarily adopted in ignorance of wider issues, but as a technique. The challenge is to reduce without losing meaning in the context of the issue being addressed.

To some degree this is analogous to differentiating between macro/meso and micro-economic impact evaluation. Varga identifies the macro/meso dimension as providing the focus on and measures for absolute and relative changes in outcomes such as GDP, employment and wages through policy intervention. Where micro level evaluation assesses immediate impacts of project intervention via benefit-cost analysis or similar and their propagation vis input/output relationships, income multipliers and technological spill-overs (Varga, 2015). Arguably the transition to place-based approaches necessitates application of meso/macro modelling to the defined place but with a broader scope of outcomes, reflecting the triple bottom line construct as it relates to that place.

At the specific meso/micro intersection identified in the development pathways phase above, while this positioned as a management tool, the structure also supports traditional economic modelling approaches. The rows provide the basis for considering sector "production functions", with the interventions determining the "factors of production" and modelled using standard linear regression modelling. This enables the relative contribution of the interventions on the dependent variable defined as "required condition" to be assessed and to support prediction of changes in the intervention mix.

The columns in the following development pathway presentation reflect interventions as changes to available community capital. Standard forms of regression analysis meet the single sector production function analysis requirement; single equation can provide a current depiction for a specific sector, including the use of lagged independent variable to understand the temporal relationship, while the use of panel data, utilising the same equation structure for the sector over a time period, combining time series and structural approaches, identifies the relationships between the dependent and independent variable within the period and between periods. This provides, for example, an understanding of the relative impact of the intervention(s) over a longer timeframe and within the current period; for example, the analysis may identify change in the regional output profile that leads to change to regional productivity, important in terms of achieving regional and national competitiveness, but also identify that it is more influential in the short run and decline over time.

The introduction of wellbeing in *New Rural Policy 3.0* (OECD, 2018) is a challenging step for econometricians. It introduces a macro dimension that is a composite variable, unlike other meso variables such as productivity which have a very specific and narrow definition. This introduces the domain of indices, in particular composite indices derived from a diverse range of actors which can be constructed in non-compensating forms that prevent a final index number being skewed by strong results in one input overweighting stasis or decline in another. Examples The ability to 'drill" into the result to identify the results in the determining variable is a key characteristic.

The meta-framework that forms the representation in this thesis, squarely places regional development in the complex domain of the simple, complex and complex sequence (Patton, 2010); the consequence of which is that the concept of certainty in relation to what outcomes will result from specific interventions regardless of their success elsewhere (Archibald, et al., 2018) regardless of the robustness of the evidence. This highlights that while expectations and targets remain defined, the interventions require intensive monitoring to discover and comprehend what pattern of responses emerges.

Notwithstanding, there is a difference between interventions that are aimed at tangible and intangible forms of community capital. The direct and indirect economic impact of investment in infrastructure on income and employment is able to be relatively certainly calculated in most places using benefit-cost analysis and some form of input/output relationships, estimating the potential social benefits is more problematic. The challenge of designing, predicting and evaluating increase when the intervention includes or is based

around more intangible interventions focused on improving stocks of community capital such as human and social capitals.

As a Place-based System

Place-based development is multi-dimensional, it "forces" consideration of a range of perspectives, notionally summarised in the triple bottom line as environmental, economic and social; inherent within this scope is "with what balance" and immediately raising influences arising from culture, values and consequent behaviours.

Consideration of the meta-framework within the ambit of evolutionary economic geography and complex adaptive systems introduces self-organising systems and the potential of considering places as both a system and as an organisation with highly reflexive responses to signals. The utilisation of business intelligence approaches to the structuring, organising and use of information, formal and knowledge and values framed signals as part of a reflexive system is a potential complement to traditional economics modelling.

This form of representation of the meta-framework is motivated by the Kaplan & Norton strategy map logic (Kaplan & Norton, 2000) based on their "balanced scorecard" approach; integrating the Learning & Growth, Internal Process, Customer and Financial perspectives into a map that demonstrates the lead and lag relationships between these four business perspectives and the key areas of focus within them. Kaplan and Norton articulate the five key principles required for building strategy-focused organizations:

1) translate the strategy into operational terms,

2) align the organization to the strategy,

3) make strategy everyone's everyday job,

4) make strategy a continual process, and

5) mobilize change through strong, effective leadership.

While these principles are focused at the organisational level, these principles, the interconnected structure, lead/lag relationships and the use of a map to present a complex context on a page, use data to represent relationships, link this to contemporary business intelligence approaches and "scorecard reporting" provides a reference point for the use of meta-frameworks applying this logic and application to public policy generally and place development in particular.

The meta-framework can be represented as a "balanced scorecard" in-line with business intelligence representations and the Kaplan & Norton approach. (Kaplan & Norton, 2000) This approach supports the establishment of specific condition targets and in conjunction with weighting of importance and variation around the "target" enables the map to be presented as a scorecard and colour coded as the front piece to .some form of relational model architecture that sits behind the results. This architecture also enables the element "score" can

be formed as a composite result based on multiple variables. The relationship between this and the use of indices is apparent.

The "executive reporting and management" orientation of these representations and technology does provide a perspective that is consistent with place development; the multi-perspective and dimensional complexity that characterises regions; and the management of place as an "organisation" of parts that have multiple omni-directional relationships.

The role of these executive reporting systems is broadly to:

- Visually consolidate important management information on a page;
- Identify exceptions to expectations, benchmarking and variation; and
- Focus future action.

In addition to relevant and accurate data, the time critical nature of information is important; this is framed by the dynamics of the context. It is premised on understanding that some information is critical on, for example a weekly basis, while other information is useful on a longer term basis because of either a lagged relationship to the drivers of the result or because variability in the short term creates false signals or noise. Within these management approaches and support systems there is a key focus on adaptive management.

These approaches tend to be "relational", not necessarily determined using the same tests as those on which econometric models are based. The capacity to run scenarios, or to "shock" the system provides a pathway to understanding, simulation and explanation of the relationship between results. As a commerce focused tool, the time-frames between cause and effect are both short run tactical and longer run, strategic, the parallel with the micro-macro duality that is problematic in regional economic modelling. Space blind interventions become "another externality" that shocks the system in terms of modifying the intervention mix or impacting behaviour.

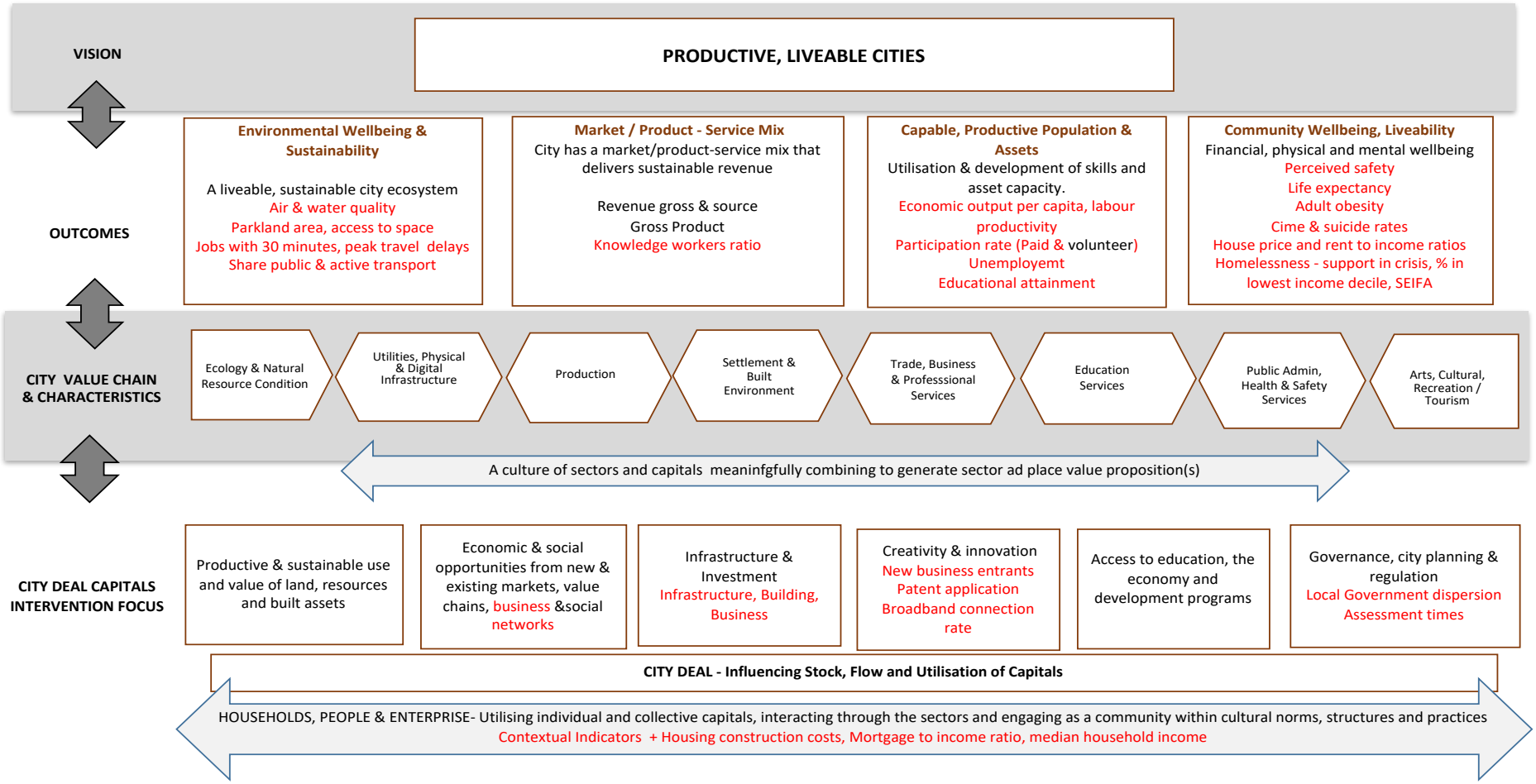
The multiple perspectives and variation in time between intervention, output and outcome between the perspectives challenges traditional regional development modelling. The challenge can be met by:

- Modifying the application and focus of existing models;
- Introducing new approaches and thinking such as offered by business intelligence approaches; and/or
- Combining both approaches to optimise the benefits of both in informing place development.

This multiple perspective, dynamic and adaptive management approaches converge to offer an alternate, managed approach to place-based development to complement the traditional linear economic development models. The business intelligence approach has the potential to offer great flexibility and an iterative approach to considering the interplay of connectedness and dynamics, this is the domain of machine learning and artificial intelligence.

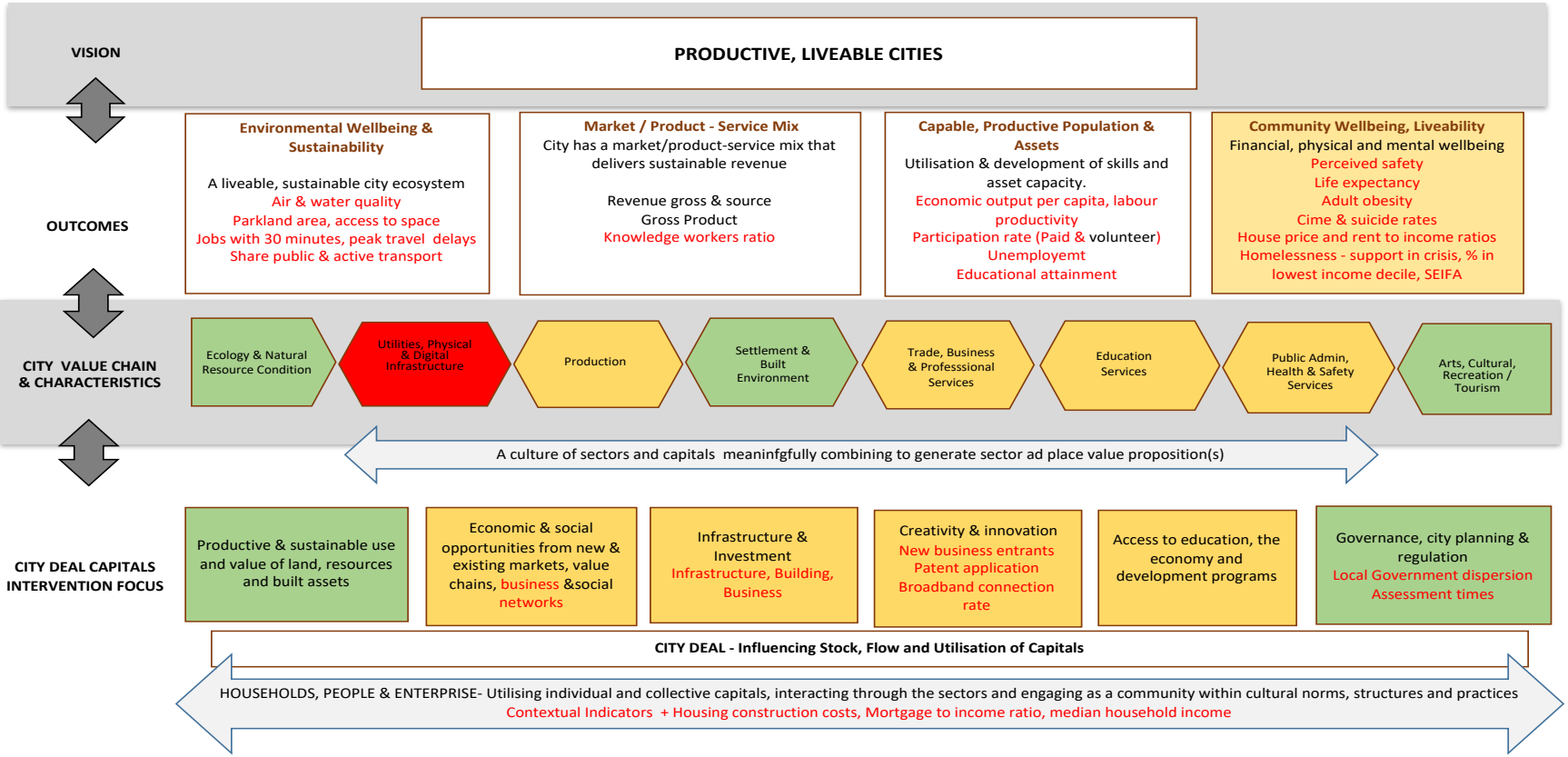
The following representation of the National Cities Performance Management Meta-framework applies the range of measures to an adapted regional meta-framework and colour codes the notional scoring as a variation to target.

Figure 3.8. National Cities Performance Management Meta-framework



"Drilling down" from the element highlights the causality, in tabular form.

Figure 3.9. Place-based Meta-framework – Business Intelligence Representation



This utilisation of the meta-framework as a summary performance scorecard demonstrates "wellbeing" as a composite result, derived from results drawn from a mix of capitals and micro-dimensions. Weighting and targets derived from community workshops in place, rather than factor analysis that is most commonly used in national indices. This summary form can be complemented by tools that provide a deeper level of understanding and explanation of results and cause/effect relationships.

Importantly this approach is complementary to more traditional economic modelling techniques. It does however challenge the notions of models based on prior relationships, reduced numbers of variable, notions of equilibrium and linearity. Similarly, the micro focus and lack of connections between the micro and meso/macro dimensions are identified as both weaknesses in and challenges to economic development models globally (Varga, 2015). The connections between the elements of the model, including the influence of policy at the micro dimension and consequent flow-on to the meso and macro dimensions are critical; this micro-meso connection is the focus of the following discussion on "contribution"

Conclusion

This Chapter has undertaken the transformation of the general form of the meta-framework proposed in Chapter Two to a place-based development construct. In doing so it has extended the policy making and analysis research into the development field, in particular as it related to the new rural paradigm and the OECD Rural Policy 3.0 construct.

The utilisation section highlights the role of the meta-framework and its associated process mechanisms as a "home and complement" for development and management concepts and practice that require a fit to dynamic systems context to achieve their purpose and within which to also develop.

The utilisation approach is designed to acknowledge the challenges identified in implementing place-based development and reinforces the use of the meta-framework within which to address these challenges. The approach described is based on achieving practice that has a theoretical basis and delivers the necessary representation, understanding and explanation of policy and strategy development and implementation within a complex development context.

Chapters Four to Six following, provide case study examples of the meta-framework applied within a place-based development approach while also reflecting three different purposes:

- Place – three cases focusing on the integrated, systemic development within geographically defined places, each motivated by different needs and circumstances demonstrating the application of the regional development construct within those specific circumstances as the basis for redefined strategy, positioning and management;

- Industry in Place – Consideration of the Tasmanian Abalone Industry over its establishment and maturity phases and extending this through the application of the meta-framework approach to a redefinition of "place and purpose" in line with emerging values and priorities; and
- Cultural Heritage – an example of linking global and national trends in demand for skill to a disrupted heritage value chain to exploit a latent source of place development opportunities.

CHAPTER FOUR – THEME ONE: PLACE-BASED FUTURES

Introduction

This chapter describes the use of the meta-framework as a development framework within four specific applications. The projects are Tasmanian based:

- The Northern Tasmanian Settlement Strategy;
- The Derwent Valley STEP (Social, Tourism & Economic Plan);
- The Coal Valley Tourism and Bio-Economy Zone Strategic Development Framework; and
- The Launceston Cities Deal.

The meta-framework has been utilised within each of the projects to provide the thinking framework, stance, structure, content and the focus of the associated recommendations within the context of the briefs. Inherent in this description, is the consideration of the utility of the meta-framework in addressing issues identified within the rural and place-based policy approaches and associated literature. Each of the first three cases provides an opportunity to outline and consider them in the context of the previous literature review, the *New Rural Paradigm* and *Rural Policy 3.0* and the three types of rural place identified:

i) within a functional urban area;
ii) close to a functional urban area, and
iii) far from a functional urban area.

The Launceston Cities Deal, as the fourth application, provides an opportunity to consider the utility of the meta-framework within a functional urban context, one targeted within the Australian Government's Smart Cities Policy and its associated Cities Deal Program.

The socio-technical and contextual approach as compared with the macro-focused space blind policy, is considered in terms of:

- the characteristics of place;
- the current and desired conditions, within the community capitals construct and in particular;
- the critical contextual concepts of leadership, support instruments and cultural factors that influence the balance of evolution and intervention derived development.

While utilising the framework, the applications do not mirror each other, they are place-based but are derived from different contexts for different client defined purposes. The Northern Tasmanian Settlement Strategy and the Derwent Valley projects were of a significant project scale, while the Coal Valley was limited in scope and budget. The Launceston City Deal case was derived from a starting point focused on understanding and measuring the impact of one of the City Deal initiatives, the University of Tasmania "Northern Region Transformation Project" on the northern region of Tasmania;

The Northern Tasmanian Settlement Strategy is focused on a region comprising a small city and six rural based local government areas. The relatively centrally located City of Launceston provides a functional urban area with close and far rural locations and small towns a significant number of which have altered their roles in response to economic trends and will potentially transition again in the face of investment and global trade shocks.

The Derwent Valley STEP provides an example of a community close to Tasmania's capital that from the 1940s had its traditional agricultural base augmented by private investment in a paper mill and government investment in a large scale mental health facility that together stimulated population growth and provided both employment and community infrastructure. The subsequent dependence was shocked when the mental health facility closed, and the paper mill came under productivity pressure as a result of changes in the global paper market and the need to transition from native forest to plantation resource stock.

The Coal Valley provides an example of a rural place bounding a functional urban area - an established urban area forms one boundary, a growing urban area another and a third boundary comprising established coastal settlement and Tasmania's principal airport. Within this place, agriculture until recently has predominantly followed traditional grazing practices (by area) despite 30 years of irrigation supply while changing, is based on a small cohort of innovative owners. Tourism has for a long period focused on visitation to Richmond's relatively intact 1830's streetscape, administrative buildings and Australia's oldest bridge and while attracting relatively large visitor numbers, experiences low time and revenue conversion rates.

The Smart Cities policy setting, and the associated Cities Deal Program is a significant federal government policy departure in that it is a place-based, negotiated deal around six key priority areas. The program clearly articulates the importance of environmental, economic and social outcomes as the foundation to "productive and liveable cities". The program creates a link between place and aggregate national performance through its program logic structure linking input, output, outcome and impact. This provides an opportunity to consider the relevance of place, as described in the "new rural paradigm" and progression to "places generally".

Northern Tasmanian Settlement Strategy (2010)

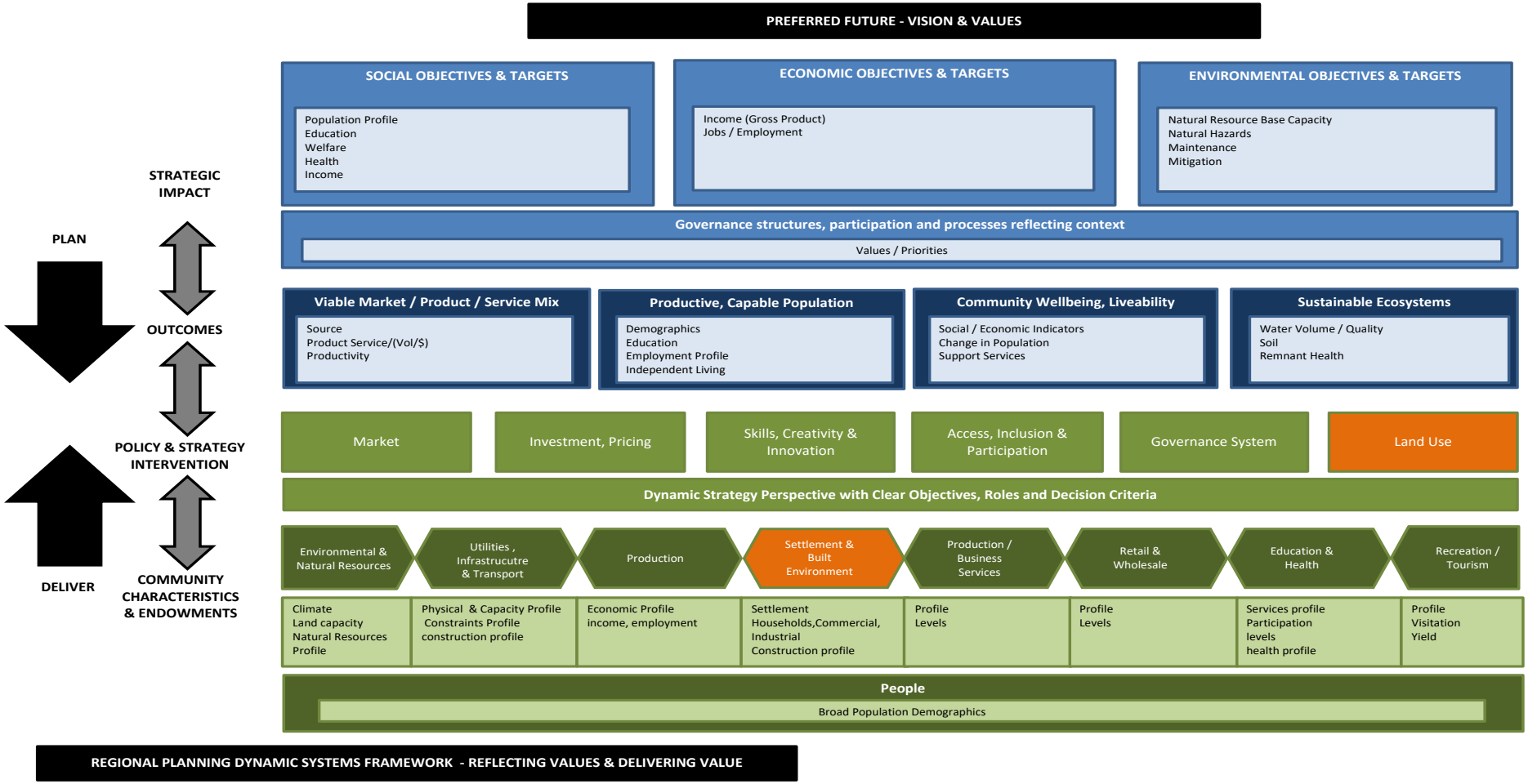
The Northern Tasmanian Settlement Strategy was an input and reference to a state government focus on improving regional land-use strategy and the consequent local planning schemes, the project was prepared under oversight of LGA land-use planners from across the region. From a regional perspective, the analysis highlighted the interdependence of settlements (and by default LGAs) as part of the regions capital mix and capacity to develop a vibrant economy and provide an attractive offer of settlements to match the diverse needs of the market. This market offer positioning highlighted the role of settlements from socio-economic perspectives to create a connection between government policy and the enhancement and maintenance of the key settlement attributes. The dynamic between the role of settlements in response to socio-economic change was analysed through foreseeable shocks to the region and conclusions relating to policy input and responses.

The Northern Region of Tasmania is home to approximately 27% of the Tasmanian Population, at the time of analysis, some 46% of them lived in the City of Launceston, the balance dispersed across 7 rural municipalities. Those municipalities bounding the Launceston urban area had population levels ranging from 12,000 to 21,000 people, while the most remote had a population of less than 1,000 people.

The report utilised the meta-framework to provide structure and focus and to highlight interdependencies between places, their description, and their regional roles and markets. The meta-framework form is provided below. This particular version includes the characteristic and performance parameters that provided the specific focus for the description and analysis that were applied to develop understanding of settlement and explanation of potential responses to the regional shocks identified by the client organisation.

The "orange" shaded cells reflect the specific project focus, within the regional context represented in the meta-framework.

Figure 4.1. Northern Tasmanian Settlement Strategy Meta-framework



The meta-framework established the context for the description, analysis and recommendations. Inclusion of the economic perspective introduced the interdependency between settlement, production, the roles of settlements and markets. Outside the commercial and manufacturing centres, the northern region exhibits a low-density economy, largely based on primary production and value adding; the local settlements across the region were established when access times were longer, and travel was challenging. This change of travel conditions led to questioning the current and future roles of specific settlement within the region as a means of understanding their socio-economic contribution and from this establishing link between policy and the enhancement and maintenance of the key settlement attributes.

To achieve this, a settlement categorisation structure creating a direct linkage between the settlement and its contribution and/or the primary reason people choose to live in the location was developed. The aim of this "outcome" approach was to help focus and align the development of land-use policy, zoning and conditions together with other development policy and strategy tools available to local government, to achieve broader strategic objectives that are the basis of broad sustainability. Arising from this is the ability to define the region's offer(s) to the market; a combination of development policy and strategy combining location and zoning to achieve specific economic, social and environmental objectives

Within this outcome or contribution approach, settlements were classified in terms of their contemporaneous primary role or function within the region:

- Economic engines – concentration of economic activity that is scale significant on a regional basis; source of external income; higher productivity; able to generate multiplier effect, attracts workers from outside
- Suburban/dormitory – convenience settlements, close proximity to services and employment, comprise both inner and outer suburbs and townships
- Economic enablers – sub regional centres within a production zone; provide a mix of business and production services to support this; provide a mix of mid-level services to community; majority of workers employed locally
- Amenity Centres – based on natural and/or built amenity and heritage. Attractive based on lifestyle, with some in close proximity of Launceston and others remote; limited range of basic to mid-level services; generally made transition to amenity from an earlier foundation.
- Rural Service Centres – generally a historical location reflecting primary production or mining; continuing to provide limited range of local services, small population; location on route may ensure traveller services.

The classification structure is spatially adaptable, for example within cities the area can be disaggregated to reflect the mix of roles that a city performs and offers to the market. This taxonomy is in contrast to spatial classification structures within formal planning schemes that tend to identify "permitted use", without creating a nexus between role of a space or place and therefore required market attributes and strategic outcomes sought. This role and contribution were represented within the following map, Figure 4. 2.. The 2010 role reflected a

significant evolution and difference in places roles over generations; demonstrating the dynamics of places.

The application of the settlement taxonomy to specific places was derived from descriptive representation of the region's economic profile as included in the meta-framework structure inclusive of parameters across the framework.

Figure 4.2. Northern Tasmania – Settlement Categories

Statistical demographic, economic and market profiling provided a representation of the status and dynamics that existed within the regional system, reflective of the "community characteristics and endowments" dimension of the meta-framework and presented for the region as whole and was disaggregated by LGA and provided a focus on the dimensions below.

Gross Regional product; Sector GRP as percentage of LGA GRP; LGA regional sector share, number of enterprises and employees. This profile enabled a perspective of production, market share and capacity of each LGA to be developed. It provided the basis to develop productivity measures by sector and LGA.

The inclusion of settlement as a sector allowed for description of the market characteristics within region and comparative analysis between LGAs and in some instances, further detail

enabled through smaller scale statistical local areas (SLAs) that differentiated between urban and rural components of LGAs. This included variables such as property profile by types and use, household composition, ownership, level and proportion of sales, purchase intent, source of buyer and comparative analysis of purchase to new build residential, commercial property. The context represented in the meta-framework and in particular the strategic outcomes reinforced the introduction of market and intent around property use and in particular the dynamics within the market.

In combination with the sector analysis the profile enabled a representation and understanding of the settlement purpose of an LGA and of the associated settlements and their roles.

The meta-framework is founded on "people in place" and their interaction and transactions as a community and within and between sectors. The meta-framework attempts to highlight connections and interdependence; the interdependence between settlements and their surrounding catchments is evident within the sector analysis, between settlements is well demonstrated in "journey to work" as a demonstrator of how people engage across regions.

Apart from the amenity centres, almost half of residential purchasers were identified as "local" rather than from outside the LGA, an indicator of the relationship between people and place and the importance of locally derived development; it also indicated a potential constraint in transferring opportunity and skills.

The population profile was a focused, partial analysis focused on population levels, age profiles and change presented as the region and SLA profile and comparisons. The stock of land availability by key settlement was mapped, leading to the conclusion that based on the historic population and market activity, adequate land supply was available to match demand forecasts within the settlements.

The utilisation of the meta-framework resulted in the development of the settlement taxonomy described above and the derivation of key strategic questions and conclusions in relation to settlement and the determinants of settlement and settlement patterns. These are summarised under the headings below:

KEY REGIONAL SETTLEMENT ISSUES AND QUESTIONS

- Population Issues _ - growth, variation in growth, internal migration and ageing
- Population Questions - population levels, capability profile, drivers
- Development questions underpinning population – maximise benefits from opportunities, transition to new opportunities, capability development and complementary activity across the region
- How does the region strategically approach the development of its settlements? – understanding and utilisation of the settlement taxonomy and its contribution to regional development

STRATEGIC CONCLUSIONS

Relating to:

- Population,
- Region's Settlement Opportunity
- Market Reality
- Governance
- Settlement's contribution to the region

POLICY POSITIONS AND IMPACT ASSESSMENT FOR SETTLEMENT TAXONOMY

Description, policy position and key statistics relating to the classification

GOVERNANCE RECOMMENDATIONS

Futures focus stance and multiple dimensions within the regional system.

SETTLEMENT IMPACT SCENARIOS FOR IDENTIFIED SHOCKS

Description, results and settlement impact and recommended strategic initiatives relating to perspectives identified by the client:

- Food bowl and associated irrigation infrastructure;
- Services growth;
- NBN and Transport access;
- Pulp mill development & forestry restructuring;
- Decline in large industry manufacturing?
- Tourism & Recreation growth
- Grey haven – Tree changers and sea changers

Conclusion

This project was an early application of the meta-framework. It provided a framework to consider settlement by connecting strategic outcomes and on-ground description and practice to help to understand how the region worked, key interdependencies and thus its settlement patterns.

The meta-framework supported integrated socio-economic contribution and a settlement classification taxonomy outside the "norms" considered by the planning profession to gain insight and understanding in relation to why and how settlement and its evolution occurs.

It attempted to break with traditional settlement classification from "land use" to one of "role and contribution" as the primary descriptor; connecting the characteristics of settlement to the primary outcome and consequent benefits people derive from living or engaging with the place, as a means of creating policy alignment and further strategic potential arising from shocks or initiatives.

The focus on settlement generated consideration of how the role of settlement and patterns of settlement propagates through the regional system and consequently the impact of shocks to other sectors flows back into the sector and settlement profile.

Derwent Valley Social, Tourism and Economic Plan (2013)

In 2013, the Derwent Valley Council commissioned the preparation of a Social, Tourism and Economic Plan (STEP) for the Derwent Valley.

The Derwent Valley is a local government area, adjacent to urban Hobart but geographically separated by a narrowing of the Derwent River valley. The Derwent Valley is bounded to the south-west by the Tasmanian Wilderness World Heritage Area and to the north-east by traditional grazing land and native forest. It incorporates the source of the Derwent River in Tasmania's highlands and carries it through to the upper tidal zone before it enters the estuary on which Tasmania's capital, Hobart, is located. The entrance from the capitals urban area to the Derwent Valley is through a 10 kilometre-long narrow valley neck, that on terminating at the Valley's administrative centre ad township, New Norfolk, opens into a wide valley floor and the foothills of the central Tasmanian Plateau and World Heritage Area. The area included in the strategy encompassed two LGAs, Derwent Valley in its entirety and the geographical "head of the valley" that is a part of the Derwent Valley geographical and economic entity but is administered by the Central Highlands Council.

The Valley has a long tradition of agriculture and forestry. Formal, built settlement occurred from 1807 with the "Norfolk Islanders" who established an agricultural base from which the economy developed, capitalising on the alluvial soils, uninterrupted access to water and the knowledge and resilience of those who followed. New Norfolk was built as an enabling settlement for these activities and for the establishment of Willow Court, as firstly a convalescence centre and soon after as an asylum.

Major change occurred to the community and its economy during the mid 20th century with the establishment of a pulp and newsprint paper mill based on eucalypt hardwood and associated forestry activity centred on Maydena. The mental health facility, the Royal Derwent Hospital commenced a major growth period during this time and Tasmania's "hydro industrialisation phase" was established primarily on the Derwent and the dams and power stations of the adjacent highlands. This construction phase tended to conclude with the completion of the Gordon/Pedder scheme in the late 1970s, however ongoing maintenance and upgrades to the power generation and water storage facilities has remained an important local activity.

The implications of this development were that for a fifty-year period there were "jobs aplenty" for two generations. Conversely, during this period agriculture struggled to compete for labour and where possible turned to capital investment as a means of substituting technology for labour, or in some instances made the transition to higher value products such as wine. The pulp mill and the "hydro" continue to provide a significant number of jobs; however, since the 1990's there has been a decline in job opportunity for lower skilled people and for the first time

in two generations young people have not had the same option of following their parents into the family's traditional employment, opportunities that were not necessarily education dependent.

Reducing employment opportunity in traditional industries was accelerated by the Tasmanian Forest Agreement, significantly limiting native forest harvesting and impacting the Derwent Valley in particular. Schirmer (2012) identified the Derwent Valley as Tasmania's 9th most vulnerable LGA to changes in the native forest industry. It is important to consider this vulnerability in the context of the Derwent Valley's high level of Socio-economic disadvantage as measured by the Socio-economic Index for Australia (SEIFA) providing an indication of the cumulative impact of the changes described above.

These structural changes left a significant proportion of the community in an extremely challenging position. They had moved from having a strong sense of purpose and identity as important economic contributors to a situation in which they are ill prepared for other roles. Many of these people are in what would normally be their most productive years. From an intergenerational perspective, the familial culture was described as similarly ill prepared in respect of preparing youth to either aspire to, or be prepared in a manner suitable to, identifying and successfully pursuing wider opportunities.

While this structural change emerged, other sectors such as agriculture have, in recognition of the natural and climatic attributes of the Derwent Valley, been connecting to new domestic and international markets by diversifying their production and investing ideas, science and funds to re-establish the Derwent Valley as a centre of high quality and high value agriculture, some on traditional crops such as hops and berry fruit and other in wine and dairy.

Tourism within the Derwent Valley failed to make the transition from the "visit and look" model of the 1960's to the socially and environmentally aware experiential and engagement focused models that dominate contemporary destination based approaches.

While agriculture attracted a level of investment and achieved the necessary critical mass to allow it to adapt and grow, within the small scale tourism sector this capacity was less evident; Investment has tended towards small scale, boutique offers. The hospitality component of the visitor economy and service profile was largely based on local patronage and not necessarily reflective of contemporary visitor needs.

The demographic. statistical profile based on the 2011 Australian Bureau of Statistics (ABS) census, reflected the following:

- A school age and parent age population proportion slightly above that for Hobart;
- A tertiary and independence age group population, slightly less than Hobart;
- An older worker and empty nester. retiree proportion slightly higher than Hobart; and
- An older age group proportion slightly less than Hobart.

The hollowing out of the tertiary and independent age group is generally reflective of rural and regional locations. This was also reflected in housing composition with the Derwent Valley

demonstrated by a slightly higher proportion of households based on couples than Hobart and slightly less in terms of single person and group households.

A skew to lower income levels across the population was partially off-set by lower housing loan repayments in comparison to Hobart. Significant stocks of vacant land, with existing service infrastructure and classified as residential, within New Norfolk and scattered small settlements were identified.

The operational and production nature of the economy was reflected in a higher proportion of technicians/trades, equipment operators and labourers than represented in the urban economy with a lower proportion of other occupation categories with the exception of community and personal service workers.

The occupational profile exhibited a larger proportion of trades and no-qualification population proportion than for Australia as a whole, with a lower proportion of the population holding more advanced qualifications.

Employment, as an indicator of economic driver activity was dominated by agriculture, forestry, construction and manufacturing (although manufacturing employment had declined between 2006 and 2011). The proportion of employment within the retail, wholesale and other commercial sectors was proportional with the Hobart profile while services, with the exception of health and community services, provided a lower proportion of employment than occurred within the urban area of Hobart. !745 individuals travelled out of area to work, compared with 605 travelling into the Derwent Valley to work.

The structure of the ABS, 2011 derived statistical profile and analysis occurred within the meta-framework construct.

It was concluded from analysis of this profile, in conjunction with consideration sector trends identified the Derwent Valley as a readily definable and marketable place within which growth and productivity improvement could occur as a result of active, strategic intervention in:

- Population growth – based on proximity to a larger urban area, relative direct cost advantage, underutilised stock of land and the mix of "country town and the Derwent River";
- Primary Production and value adding – based on soils profiles and access to irrigation, large scale land holdings, diversity of production portfolios and demonstrated success of recent investments;
- Tourism – based on a combination of natural environment, its attributes and positioning associated with The Tasmanian World Heritage Area, heritage, recreation and agri-tourism; and
- Youth development – based on introducing the notion and discovery of wider external opportunities and the value of education in realising them.

The strategic themes were identified as those where the LGA administration in conjunction with community structures and other government agencies could enhance their capacity to

contribute to identifying and facilitating/achieving the socio-economic outcomes sought. Importantly, the industry sector strategies were designed to deliver a rapid return on investment, while the youth development strategies were focused on increasing the stock of community capital and to generate cultural change; increasing the perceived value of education and improving participation.

The themes were located within the following vision:

Tasmania's Derwent Valley - A prosperous, supportive and sustainable community creatively and constructively engaging with the opportunities the wider world has to offer.

In this instance the client did not independently establish and provide the definition of the vision and strategic outcomes, these perspectives and words were drawn from the consultation and workshop processes and a range of issues identified; the combination into the specific phrase was designed to address the "inward focus" that was demonstrated throughout the consultation. This became the reference point for the themes and actions and created the constructive stance of the report.

The meta-framework was used to frame the thinking that resulted in this positioning and to provide the structure for the consultative process to move from this broad, place perspective and to engage with the communities in progressing the three functional themes identified above.

Unlike the Northern Tasmanian Settlement Strategy outlined earlier, this project was designed as a collaboration between the consultants and the community, represented in existing, or in the case of the primary production theme, formation of new, interest groups.

The Derwent Valley Council had formal linkages with:

- *The Derwent Valley Tourism Association*, a tourism operator membership based group, provided with limited administrative support and a small amount of direct funding by Council; and
- *Real Action – Future Thinking (RAFT),* youth support organisation managed by Council with a multi-disciplinary reference group comprising educators, government and community sector youth service and community support providers and Police, operating from a Department of Education facility previously utilised for student accommodation, re-purposed to provide training and other activity. Educators from across the place, also met separately to this group to form views and programs relating to the delivery of education across the Derwent Valley as did other specialist groups.

Council staff and elected councillors were engaged with the groups in both formal roles and as members.

The consultants recruited primary industry enterprise operators to create an informal working group. A councillor who operated a farm was included in this working group, providing a link directly into the elected councillor forum.

Each of the three groups contributed separately in a series of workshops, working through the process, outlined in Chapter Three. These workshops were of day-long or half-day duration over a period of 3 months. Separate, complementary meetings were held between the consultants and specific industry, government and non-government organisations to explore issues arising in the workshops. One example of this was to raise concerns relating to limits to water licenses from the Derwent River with the Department of Primary Industry, Water and Environment (DPIPWE) and from this facilitating a meeting between the agency and the working group and a formal response to their concerns.

The outputs from each of these three groups included a "themed meta-framework" and associated "development pathways", with specific defined initiatives, that nested under the overarching Derwent Valley meta-framework representation.

These varied from each other in their:

- Variation of their value chain profile to reflect the themes;
- The focus on the mix of intervention strategies; and
- The performance measures associated with the strategic outcomes.

Each of the development themes were premised on the overarching consistent strategic intent. Each meta-framework was based on the Derwent Valley Vision, with the primary industry and tourism meta-frameworks also sharing the mission and policy intervention and positioning elements, but with specific sector targets and performance indicators; where they differed structurally was in the value chain reflecting their specific sectors. The sectoral meta-frameworks primarily reflected an investment of capitals to achieve improved short run results and to contribute to community identified outcomes.

The youth futures strategy reflects an investment in developing capitals, in this instance human capital. In this instance the vision is shared with the other meta-framework structures, however the mission elements are reduced to "Productive and Capable Population and Community Wellbeing and Liveability" with specific descriptors and targets to reflect the youth development focus. This approach highlights that different strategies are being applied in a manner that contributes to the overarching vision through multi-perspective outcomes. While the meta-framework is utilizing the same mix of interventions as the remainder, they are applied within a different stance. The sector profile evident in the overarching and sectoral models is replaced with a determinants profile, enabling an intervention mix, specifically focused on the challenge. This is in line with the "social determinants of health" framework that is utilised to consider and respond to a wide range of community health challenges in Australia.

The description of these determinants within the development pathways representation provides for a continuum of risk ranging from high risk across multiple dimensions to, for example, risk of not continuing with education because of familial cultural norms. The intervention mix remains consistent with the broader model but applied in the context represented within the framework.

The constants displayed as a "place-based meta-framework" provided in the vision and mission provides a strategic context for the place and the day to day practice within the sectors/themes that form the basis for progress towards the vision. Within the place-based context, this provides the linkage between the micro and macro dimensions of strategy and performance.

In conjunction with the element descriptors it in the meta-framework it is the associated development pathways and the explicit outcomes and key performance indicators (PKIs)that provide the framework and summary focus for each development theme to follow. These are supported by comprehensive analysis, documentation and action plans.

The meta-frameworks and associated development pathways which were developed within the working group consultative processes, follow as Figures 4.3. to 4.10to allow comparative analysis.

Figure 4.3. Tasmania's Derwent Valley – Place-based Meta-framework

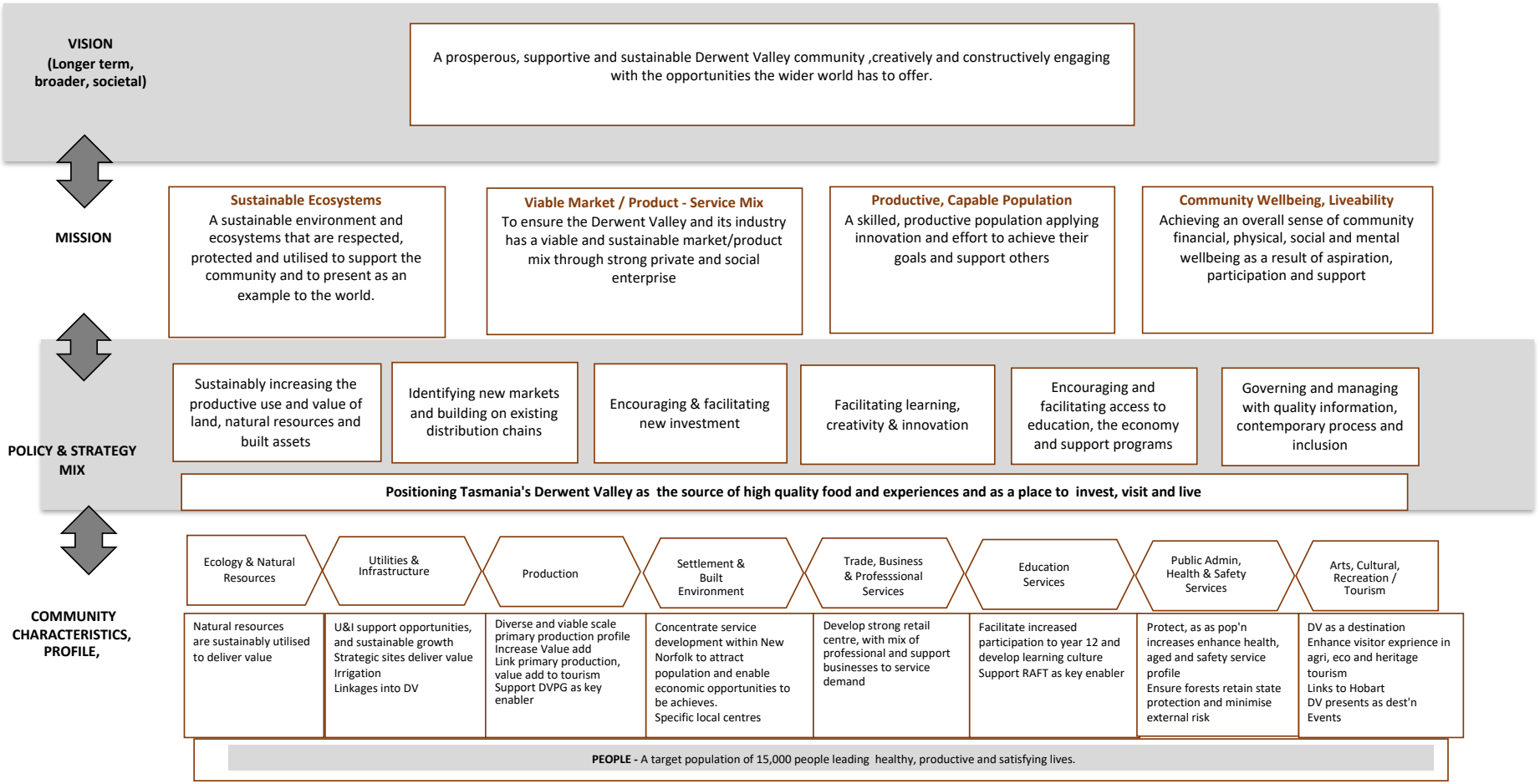


Figure 4.4. Tasmania's Derwent Valley – Primary Industry Meta-framework

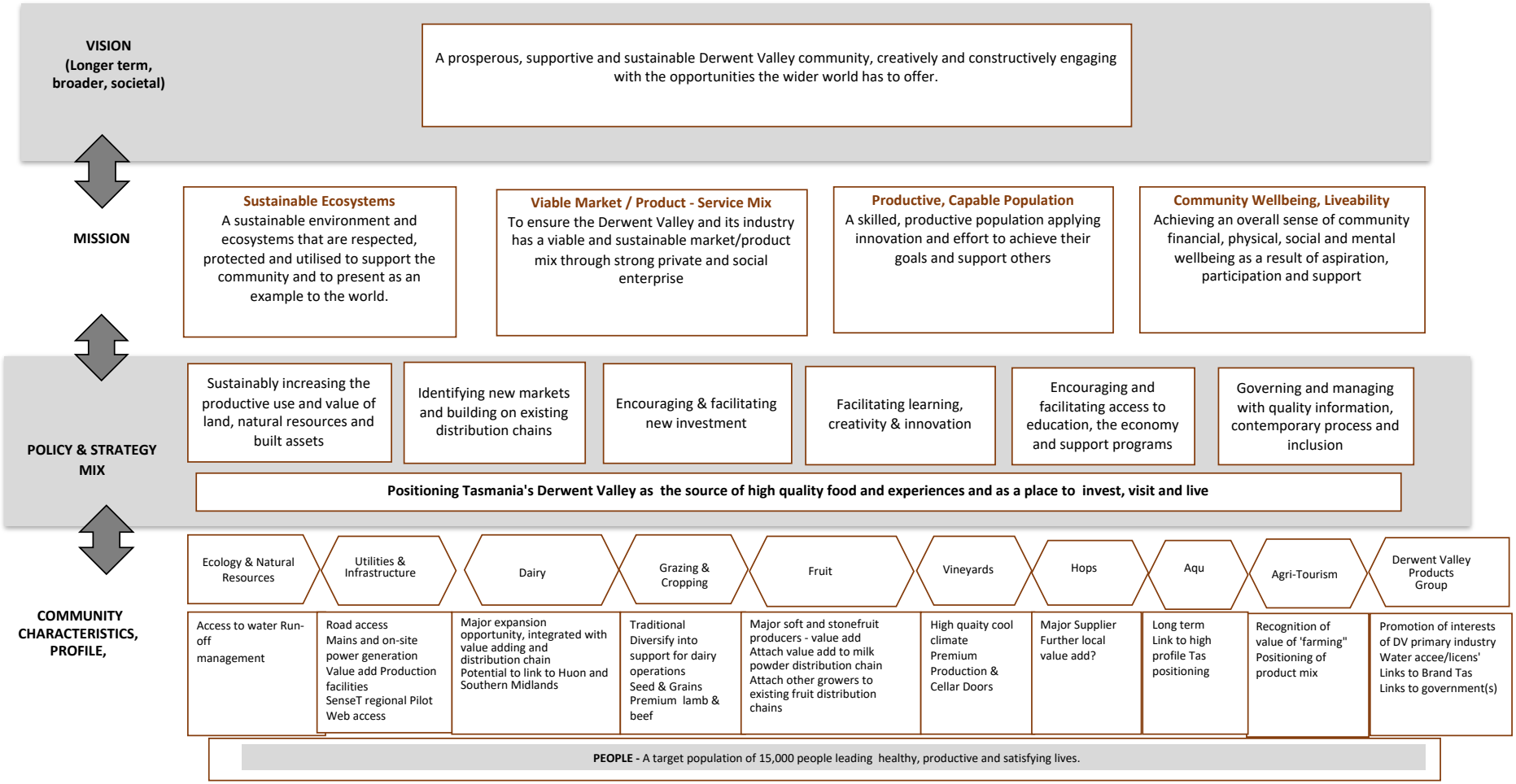


Figure 4.6. Primary Industry Development Pathways

					IMMEDIATE FOCUS					
		Ecology & Natural Resources	**Utilities and Infrastructure**	**Access to Irrigation water**	**Market Positioning**	**Productivity Improvement**	**Development Environment & Support**	**Links to Government, Community & industry**	**DV Primary Industry Advisory Group**	**OUTCOMES/KPIs**
ACTIVITY	**Linking, influencing & lobbying**		Roadside and town entrance amenity & presentation	Continue link & active engagement with DPIPWE		TIA, AIAS	DV Council		Aus and Tas governments & agencies	**Enlisting active support for positioning, strategies and projects**
	Identifying markets, positioning, opportunities and promotion/distribution chains				Tasmania's Derwent Valley Provenance Work with DV Tourism re Agri-tourism				Link to Council DV promotion	**Highly recognised, contemporary offer and conversion to Sales**
	Encouraging and facilitating investment		DV Council, DIER, Telco, with DV Council support; Sense T network pilot	Certainty, Clarification of on farm storage			Council approval stance		Strong, supportive positioning of Derwent Valley to market	**Enhanced and increased capacity, production & productivity**
	Facilitating collaboration, learning and innovation			TIA	Bundling Product, in particular Tourism; International and National linkages	TIA, AIAS			Vehicle to bring issues forward	**Dynamic, cooperative sector, celebrating innovation**
	Access to education and support programs				IT and other projects for High Schools					**Capable people making and implementing good business decisions**
	Inclusive, evidence based governance and management	Audit of Assets and capability		Market research and briefings			Benchmarking		Agenda Evidence based business case structure	**Listened to, respected change agent**
	OUTCOMES & KPIs	**Natural resources are sustainably used to deliver value**	**Supports growth, productivity, sustainability and reflects image**	**Sustainable access, equity and viable price**	**Derwent valley and its primary products, food & beverage recognised and sought after - right price**	**Best practice across all dimensions**	**Active, supportive stance leading to investment, growth & sustainability**	**Global, strategic, productive and connected**	**Effective leader, facilitator and contributor**	

Figure 4.7. Tasmania's Derwent valley – Tourism Industry meta-framework

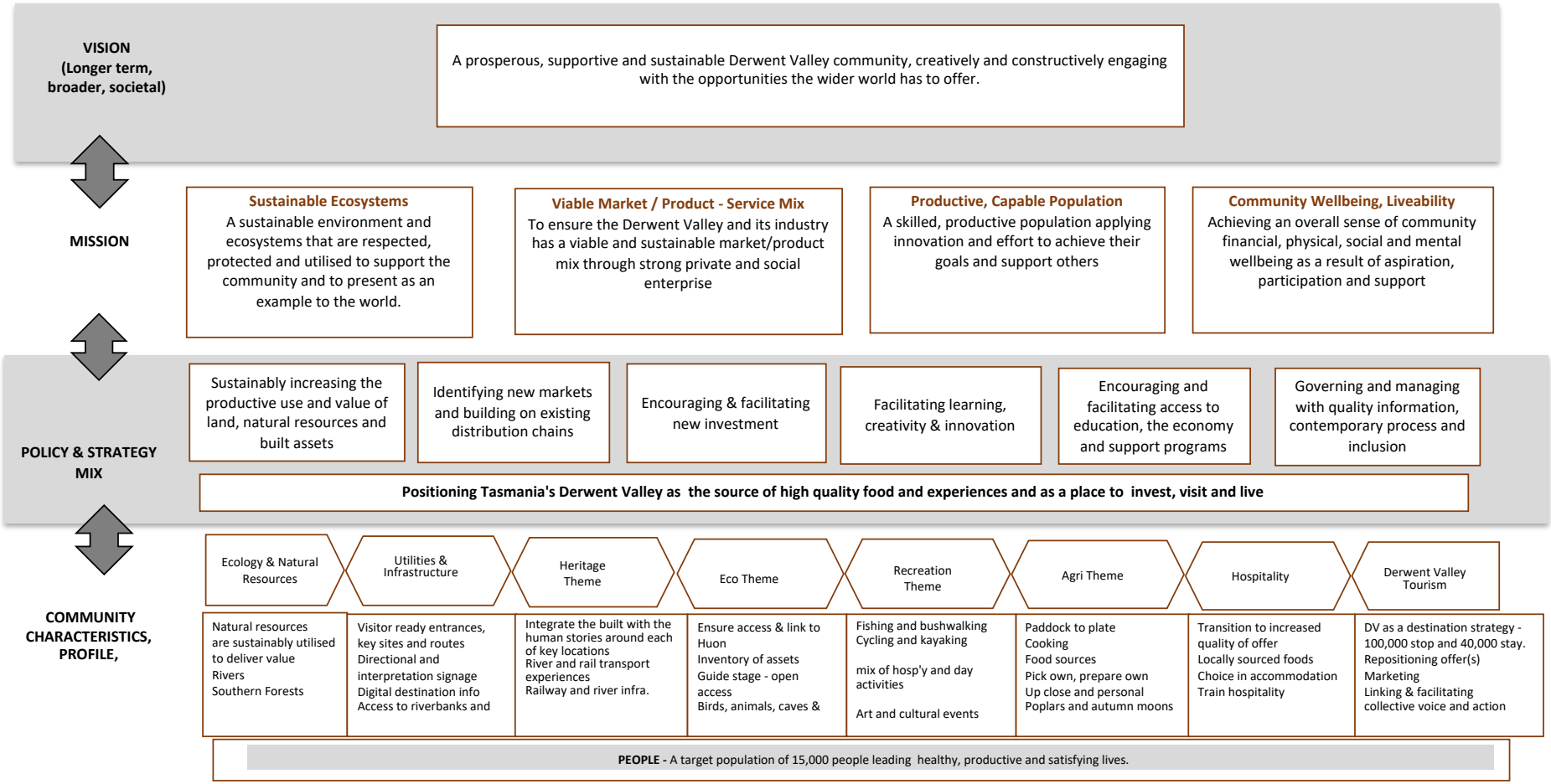


Figure 4.8. Tourism Industry Development Pathways

					FOCUS					
		Ecology & Natural Attractions	**Infrastructure, built assets and facilities**	**Visitor Numbers, Profile & conversion to Revenue**	**Product and Service Mix**	**Skills & capacity**	**Business Growth & Viability Support**	**Regional engagement**	**Rivers Run Tourism Association**	**OUTCOMES/KPIs**
ACTIVITY	**Linking, influencing & lobbying**	Access to Southern Forests	DIER - signage DVC - entrances Visitor Centre integration, Gravel Road uses by Hire Cars calarification	Stong industry and government links, Tourism Tasmania, Parks and commercial operators	Internal business links and JVs, cross selling as key self help and basis on which to work together	Partnering with Skills Tasmania and THA	Potential investors	Destination Southern Tasmania	Aus and Tas governments & agencies	**Enlisting active support for positioning, strategies and projects**
	Identifying markets, positioning, opportunities and promotion/distribution chains	Repositioning eco-tourism and introducing social history	Summer busline to areas such as Mt Field; keep access to key areas in WHA	DV Marketing Plan theme trails, clusters Interpretation narratives; Bundle existing to key themes & positioning Digital guerilla marketing as interim entry	Inventory of existing businesses and their offer	Fit to Asian Markets and specific needs, in particular Chinese - Use China ready funding to dvelop broader skills and approaches	Forest transition funds Micro- Businesses	DST & DEDTA briefings to members	Facilitating a strong promotional presence in key visitor planning tools such as regional guides and publications.	**Highly recognised, contemporary offer and conversion to numbers and expenditure**
	Encouraging and facilitating investment	Forest transition funds	Derwent & natural attraction infrastructure DV Rail/connectivity feasibility				Business Development program Investment ready projects	Complementary offers to major attractors		**Enhanced and increased capacity**
	Facilitating collaboration, learning and innovation	Parks, Hydro, Inland Fisheries etc and working group		Busiensses working together to provide joint offers	Social media, guerilla marketing to web through schools	Hospitality standards, accreditation across Derwent Valley		Familiarisations	Working together and with key players to learn and spark new ideas	**Dynamic, cooperative sector, celebrating innovation**
	Access to education and support programs				IT and other projects for High Schools	Business Management workshops, TQUAL				**Capable people making and implementing good business decisions**
	Inclusive, evidence based governance and management	inventory of Southern Forests, WHA assets and attributes & key features		Market research and briefings	Tourism trends		Business performance benchmarking		Agenda Evidence based business case structure	**LTA with strong membership, productive activity level and strong positioing with stakeholders**
	OUTCOMES & KPIs	**Natural resources and attractions are sustainably used to deliver value**	**Visitor ready presentation, ease of access, safe**	**Derwent Valley recognised, converts to visitation, adapts to change**	**More diverse, strong and evolving product mix, visitor satisfaction**	**People viably delivering unforgettable, positive visitation expererience**	**Capacity torecognise and take advantage of opportunities**	**Strong part of and contributor to Southern Tasmania's offer**	**Effective leader, facilitator and contributor**	

Figure 4.9. Tasmania's Derwent Valley – Youth Futures Meta-framework

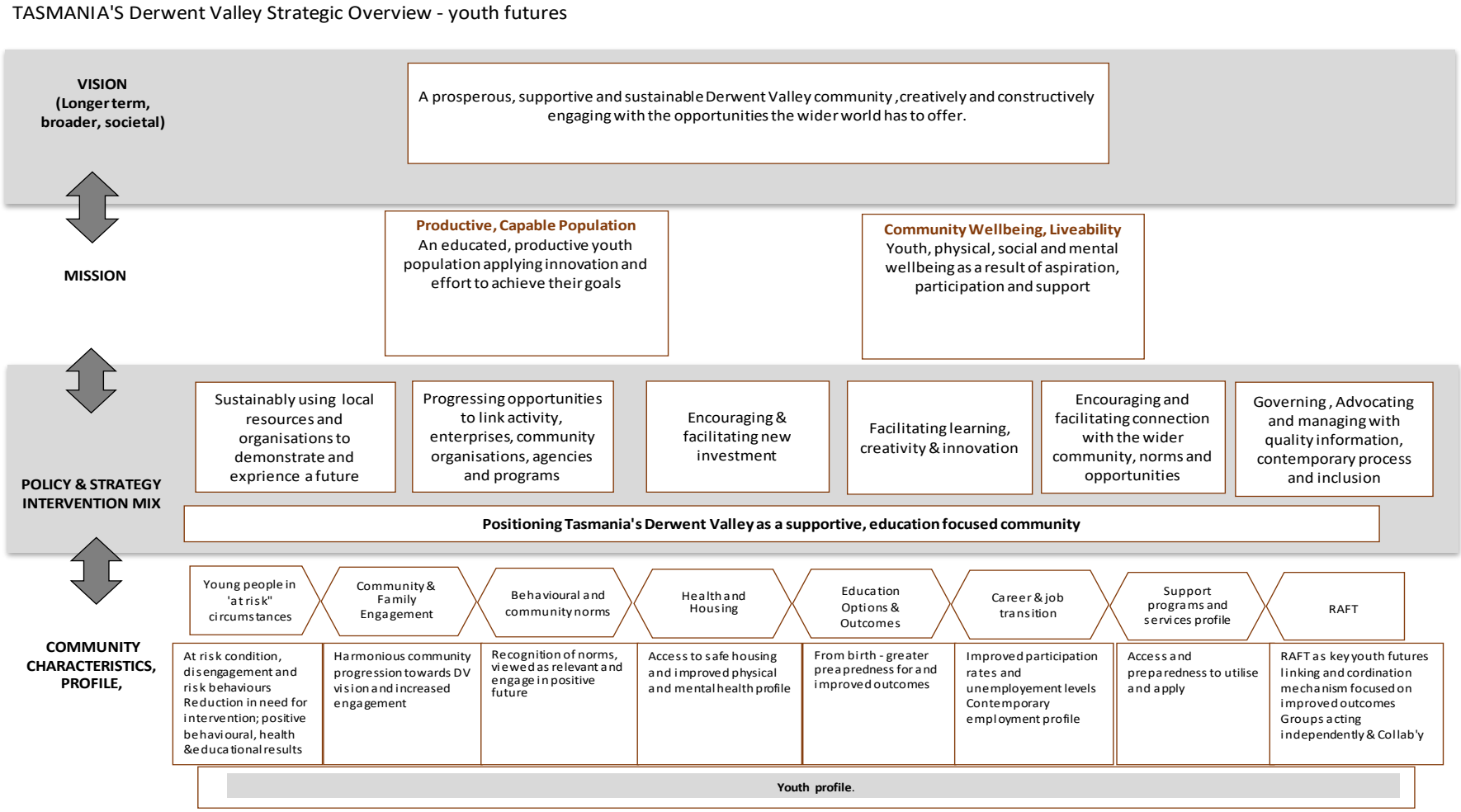


Figure 4.10 Tasmania's Derwent Valley - Youth Futures Development Pathways

	Young people in "at risk" circumstances	**Community & family engagement**	**Behavioural & community norms**	**Health & Housing**	**Education options & outcomes**	**Career & job transition**	**Support programs & services profile**	**OUTCOME SOUGHT**
CURRENT CONDITION For specific locations and groupings	Poverty, homelessness, substance abuse, criminal activity, disengagement from education	Division re post y6, strong community & family engage in community events, business support for schools, DV Council strong role	Strong support for norm behaviours, evidence of support for sex and substance based behaviours Employment focus	Evidence of poor dietary choices, strong sporting profile, some smoking & substance abuse	Issues around retention for 11-13, Outcomes affected by poverty'. Learning Precinct to guide & strengthen collaboration	Some young people not in school, education or work Strong focus & partnerships	Child & Family centre strengthens, NGO presence, range of physical & mental health support, most p/t but regular	
Using local Resources & people to Demonstrate &Experience options	Use outcomes to find realistic common ground – Sport & recreation clubs, Service Clubs, Community House, Community Shed + fewer formal networks and groups		Identify, rather than hiding & ignoring, issues Identify community resources Hear and promote student voice.			Linking contemporary interests into curriculum		**Actively and productively engaging all available resources and tools, Age diversity, C'ty group membership, joint ownership of challenge**
Linking to key organisations & agencies	RAFT Forum Use outcomes to find realistic common ground – Sport & recreation clubs, Service Clubs, Community House, Community Shed + less formal networks and groups			Collective responsibility to tackle substance abuse& mental health	Derwent Valley Learning Precinct	Business awareness & opportunities for experience Shed & e.g. Frascati type heritage projects		**Scope of service fits needs, minimising overlaps and "gaps" Young people are supported and feel OK in seeking support. Linkages delivering collective impact.**
Encouraging & Facilitating New Investment	Guiding principle – who has same interest and/or outcomes focus							**$ & resources match task and provide for innovation and adaptable approaches**
		Schools Capital Works programme			Link to community activities	Carinya Training Training gaps analysis		
	Young people in "at risk" circumstances	**Community & family engagement**	**Behavioural & community norms**	**Health & Housing**	**Education options & outcomes**	**Career & job transition**	**Support programs & services profile**	**OUTCOME SOUGHT**
Facilitating learning, creativity & innovation	Broadening the concepts of learning and creativity – engaging in strategic themes of tourism, primary industry, value adding and other enabling industry sectors – hook & relevance to generate sense of meaning and future incorporating a strong sense of New Norfolk/Derwent Valley balanced with a wider regional and world view.							**Creating environment and culture that engages**
Connecting with wider community, norms & opportunities	Promoting positive view and positioning of the Derwent Valley A communication and linking strategy – integrate the student voice project (DFAT); and schools. Labour brokerage for seasonal and part-time work							**Assets are identified, available, capable and prepared to engage Numbers engaged & profile**
Governing, advocating & managing to make difference	Understanding needs and advocating – within and outside the Derwent Valley – Alignment; Data, Coordination& Design; informed evaluation; Joint venture Birth onwards focus High level training for key personnel, recruit and retain high quality							**Improved socio-economic results for individuals and the community as a whole Participation in opportunities**
OUTCOME	**Reduction in need for interventions, positive behavioural, health and educational results**	**Harmonious community Progression towards DV vision Increased engagement**	**Young people recognise norms, view as relevant and engage in positive future**	**Improved, physical & mental health profile and access to safe housing**	**From birth - greater preparedness and improved education outcomes**	**Improved participation rates and unemp't levels Contemporary employment profile**	**Access & preparedness to utilise and apply**	

Governance and Implementation

The transition to this approach was reflected in the program and Council's overall governance structures. This "place" framework is supported by changes to Councils governance framework including refocusing its major committee structure to reflect the "mission" dimension of the framework. The pilot in this is an "Economic Development Committee" implemented in line with role and function recommendations within the STEP Plan

The working groups have continued to utilise the framework and development pathways, guiding recurrent activity within the youth program and supporting the integration of the tourism initiatives into the broader Southern Tasmanian Destination Management Planning process.

Council adopted the strategy's governance recommendations to adopt a formal committee structure to reflect he social, economic and environmental perspectives within the Mission to consolidate a large number of specific purpose committees. An "Economic Development Committee" was formed as a "pilot".

Conclusion

The meta-framework provided the first application of systemic thinking to strategy within the Derwent Valley Council and the associated working groups.

It provided clarification in strategic focus and provided a clear action framework in key areas of endogenous capability/potential and in addressing challenges in achieving contemporary education participation rates and levels. Awareness of the concept ensured that the triple bottom line construct was seamlessly adopted as a driver.

The meta-framework drew out views around a lack of cohesion and collaboration within and between industry sectors and the connections between, for example, education and industry and its future potential. In conjunction with a significant culture of insularity opportunities were either not identified or constrained by a lack of foundation capitals.

The framework highlighted the arenas complementary contributions to the overarching Derwent Valley Vision, the complementary development pathways provided multiple and combined approaches to its realization.

Working groups adopted and adapted to inclusion and consideration of outcomes and multiple strategic options and mixes within the meta-framework approach subject to time spent and re-iterative working sessions. The challenge in transitioning from the Meta-framework directly to the development pathways was the catalyst for the design of the contribution map, identified in Chapter 3.

Coal Valley Tourism and Bio-economy Zone Strategic Development Framework (2018)

The Coal Valley is predominantly a peri-urban rural landscape within boundaries of the City of Clarence and extending into adjacent LGAs Sorell, Southern Midlands and Brighton. Clarence City Council and to a lesser extent Brighton Municipality, form the eastern urban component and are separated from what makes up greater Hobart, Tasmania's largest population centre and seat of government by the Derwent River.

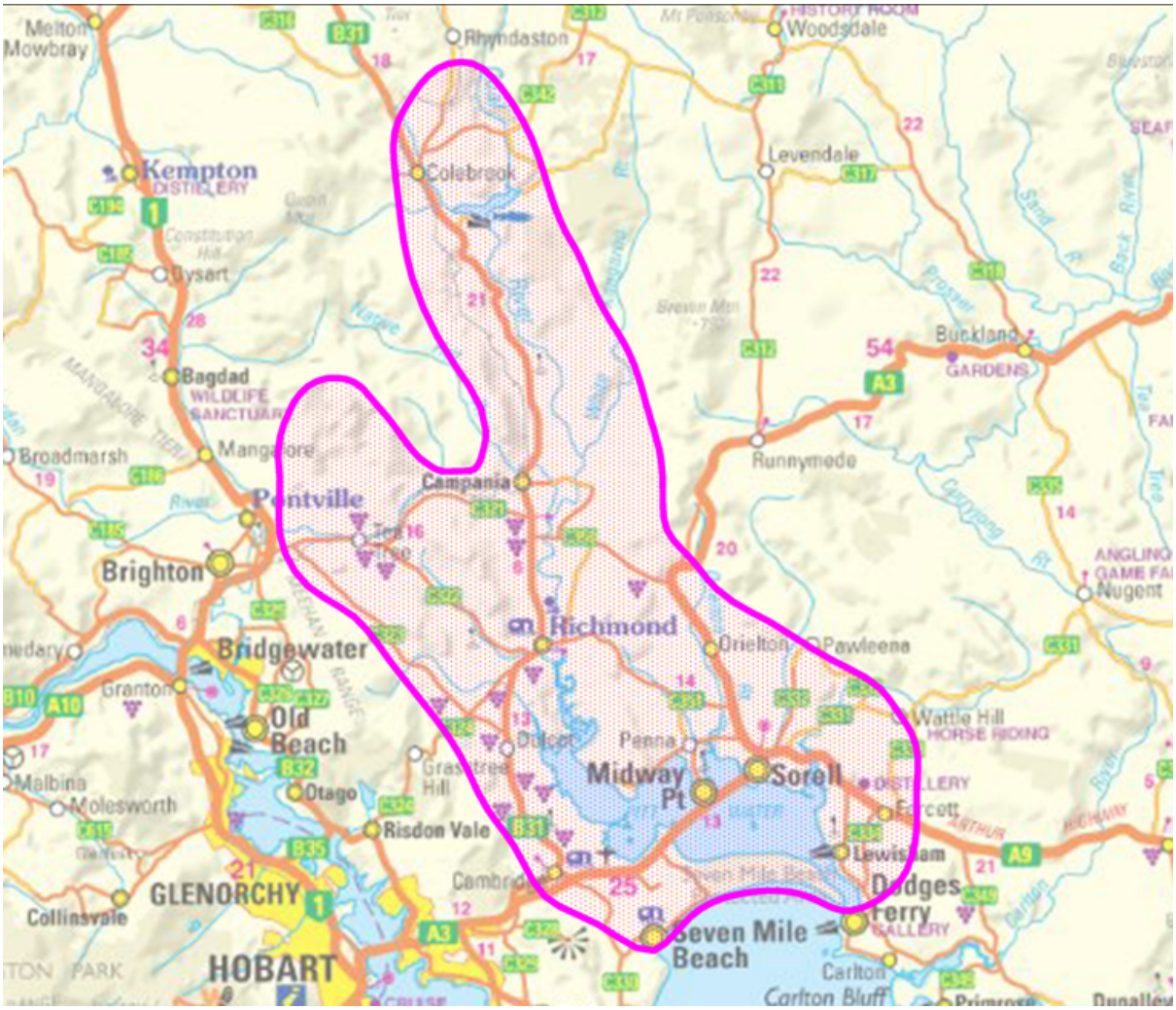
The Coal Valley partially reflects the OECD categorisation of "close to a functioning urban area". Urban Clarence and Brighton form a western boundary, Tasmania's principal airport and commercial, light industrial development its southern coastline and the growing settlements of Sorell make an incursion into its eastern side.

Given its difference to the adjacent urban area, the need for a discrete economic development strategy for the Coal Valley was identified by Clarence City Council as part of the adoption of the City's economic development strategy in 2016.

The strategy was to provide strategic development themes, establishing a framework for the subsequent management and implementation by existing sector development groups, with necessary augmentation of resources, working in conjunction with a "place-based" overarching group, combining sector and broader government and enabling enterprises and institutions participation.

The zone overlay to the place is provided in Fig 4.11. below.

Figure 4.12. Coal Valley Tourism and Bio-economy Zone



The Coal Valley was the location of some of Australia's early transition to English farming practices in the 1820s, finding export markets for grain in Sydney; these markets were largely lost as the Sydney settlement was able to be served by producers located closer to the market.

It has undergone significant change over the past 30 years to become:

- An attractor to some 25% of Tasmania's interstate and overseas visitors;
- A user of irrigation to produce a diverse range of higher value crops across some of its area;
- A recognized wine production zone attracting visitors and corporate investors alike; and
- An expanding irrigation area that, through potential increased access to recycled water when added to existing schemes will result in a total of some 15,000 Ha of irrigation land across the zone.

The proximity of the visitor and primary production zone to Hobart Airport, the Cambridge Industrial Park and metropolitan Hobart provides a unique positioning in Tasmania providing additional opportunity and capability.

The valley, until the construction of the Craigbourne Dam and irrigation infrastructure in the mid 1980s reflected traditional dry-land grazing practices and a small, long term population. Since this initiative development occurred incrementally; through people identifying opportunity, learning and progressing innovation in practice and product/market mix. Despite some stellar individual examples, there has been no structured, long term process to convert opportunities into economic activity. Richmond Village established in 1828 and by retaining its streetscape and stock of early to mid 1800 buildings and Australia's oldest bridge has long provided a heritage tourism centre to local and tourist visitation.

Tourist expectations and some businesses are expanding from its traditional "Richmond" heritage base to include wine, food and agri-tourism experiences. Research indicates that although Richmond achieves high levels of visitation, it is less successful in converting these to either stop or to stay for a duration that encourages a significant spend. This reinforces the limited value of using visitor numbers as a key performance metric.

Both of the key sectors that reflect the potential specialisation of the place reflect low productivity as a result of low levels of conversion of land area, visitors and capital stock to revenue.

The project was commissioned by Clarence Council, consultation and working sessions occurred with a range of local, industry and agency stakeholders and a workshop including local government and industry representatives.

The workshop participants noted that both the tourism and agricultural sectors require a strategically focused step change if they are to build on existing initiatives and achieve the potential arising from Tasmania's position in key markets and return on investment in marketing and infrastructure. The Coal Valley local economy potential aligns to 2 key Tasmanian Government strategies:

- An annual Agricultural Production Value of $10 billion by 2050 (DPIPWE 2017); and
- Visitor Numbers of 1.5 million and expenditure of $2.5 billion by 2020.

Analysis of the current state was framed by the "value chain" sectors within the meta-framework, differentiating between:

- Economic drivers – primary production; tourism & recreation and added value creation; and
- Economic enablers – climate, ecology & natural resources; utilities, infrastructure & logistics; industrial, trade, business & professional services and education & training.

Each section included a summary of the current position, and strategic actions designed to either directly progress or to enhance contribution to performance and productivity within the context of the meta-framework structure.

The analysis indicated that there was significant, latent growth and productivity potential through:

- The increased and more productive use of irrigation, that with the knowledge gained since inception, provides the foundation of increased scale, diversity, intensity and productivity;
- High levels of visitation, converting visitors to longer duration of stay from the current relatively low level and increasing expenditure in the zone through new, contemporary offers;
- More diverse and improved product and service value by better combining both key sectors and processing local and products for third parties outside the zone; and
- Increasing the uptake and productive use of resources, technology and decision tools to improve performance and productivity.

The location of the Coal Valley adjacent to Greater Hobart and inclusion of Hobart International Airport within the zone, provides close access to local, national and international markets; the basis for increased global connections and opportunities.

While there was a technical capability, the manner in which the potential was 'signalled" to the local community and external markets was considered important. The challenge was to send a constructively disruptive signal to identify it was not "more of the same", this was formed as a consequence of the applicability of "bio-economy" principles and existing uptake of recycled water for irrigation and within the tourism sector an emphasis on conversion rather than attracting more visitors. The basis of this sectoral and combined positioning was framed in global trends.

Globally agriculture is re-positioning. A significant component of this is framed around the principle of a bio economy. A bio economy is defined as *"the production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed, bio-based products as well as bio-energy"*[1]. This approach identifies multiple opportunities beyond traditional agriculture and like "place-based" development is multi-disciplinary in their approach. The current use of re-cycled water for irrigation and its further potential is an example of this bio-economy approach; productive use of a waste product.

The Organisation for Economic Cooperation & Development (OECD) and European Union (EU) bio-economy themes provide examples of an emerging global trend that builds on the Coal Valley's increased diversity, utilisation of technology and of recycled irrigation water (with potential for more) into the zone that could provide a step change to the primary industry economy; how it is defined, perceived and the contribution it makes to the South East

[1] Review of the 2012 European Bio economy Strategy, Nov 2017, European Commission Directorate-General for Research and Innovation, Directorate F — Bio economy Brussels

Tasmanian economy. This approach is proposed as a means to establish a national position for the zone. Use of the term bio-economy signals a rethink of traditional approaches to what can be produced, how the value chain works, how agriculture and aquaculture co-exist and how the environment is managed.

Similarly, heritage tourism is re-positioning globally to better integrate intangible cultural and traditional knowledge and experience dimensions to balance the focus on the tangible buildings, precincts and objects focused offer. This trend establishes a connection to a wider range of contemporary issues faced by current society and creates a resonance that engages people more deeply and for longer in a place; providing more value for the visitor and the industry.

The repositioning of both agriculture and tourism in the Coal Valley, consistent with these principles, was identified as a potential source of employment opportunity from economic development within the zone. This conclusion was based on integration and application of new knowledge, contemporary, transferable skills and utilization of the digital economy in combination with traditional approaches and practices.

Richmond is adapting from providing a dominantly traditional heritage setting to include increased focus consumption of food and beverage. A more comprehensive integration with agriculture, its past present and future will contribute to increased differentiation.

This economic growth and productivity focus on both tourism and bio economy as the local drivers provided the logic to frame the zone to include adjacent areas that reflect similar characteristics and development potential, identified as the "Coal Valley Tourism and Bio economy Zone.

This is captured in the following meta-framework and associated, summary development pathways, as a framework for a recommended form of strategy leadership, governance and strategy to progress.

The development pathways summary Highlights the cells in "red" to identify the conjoint relationships between the specific initiatives identified within the strategy.

Figure 4.13. Coal Valley Place-based Meta-framework

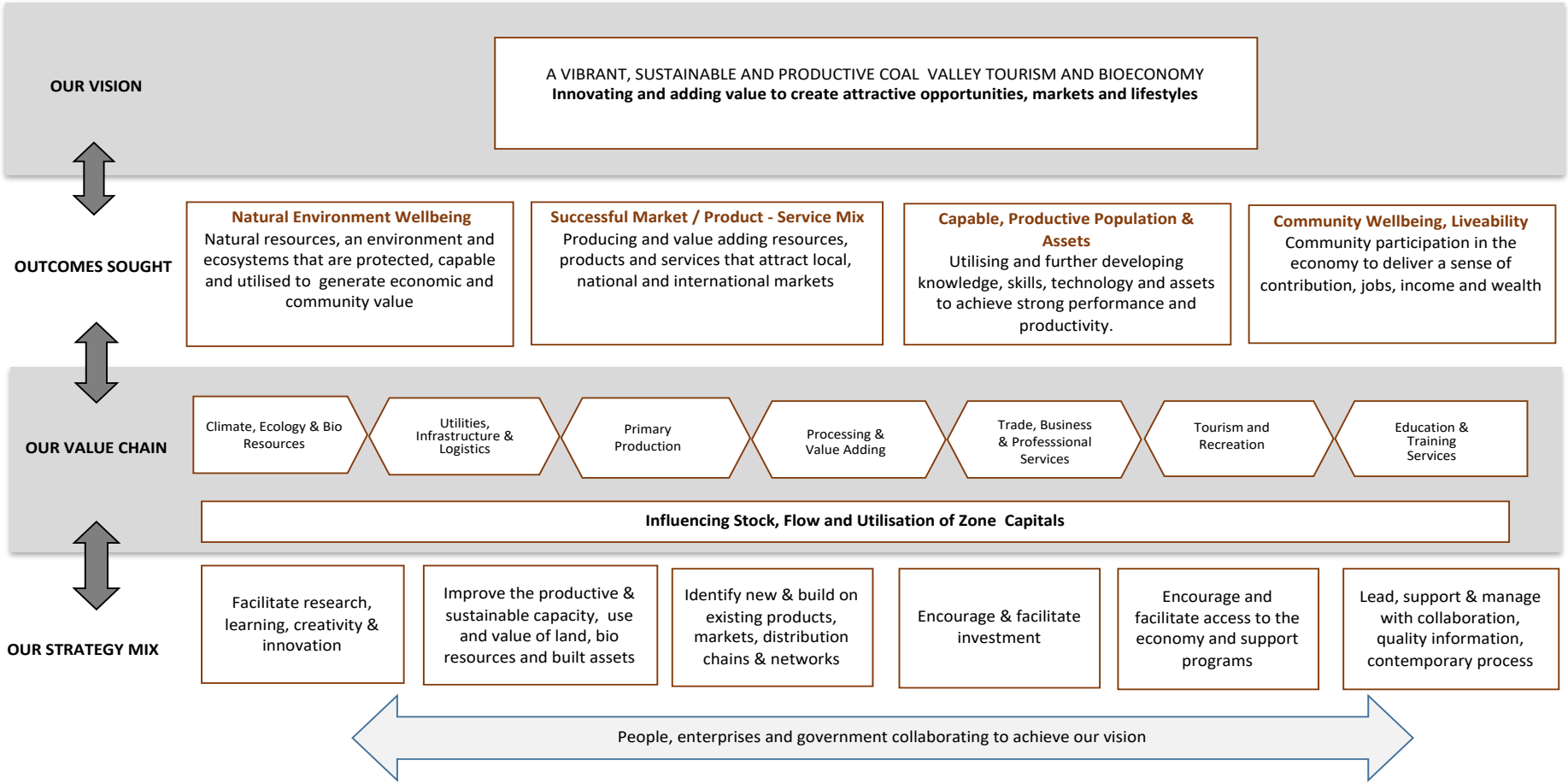
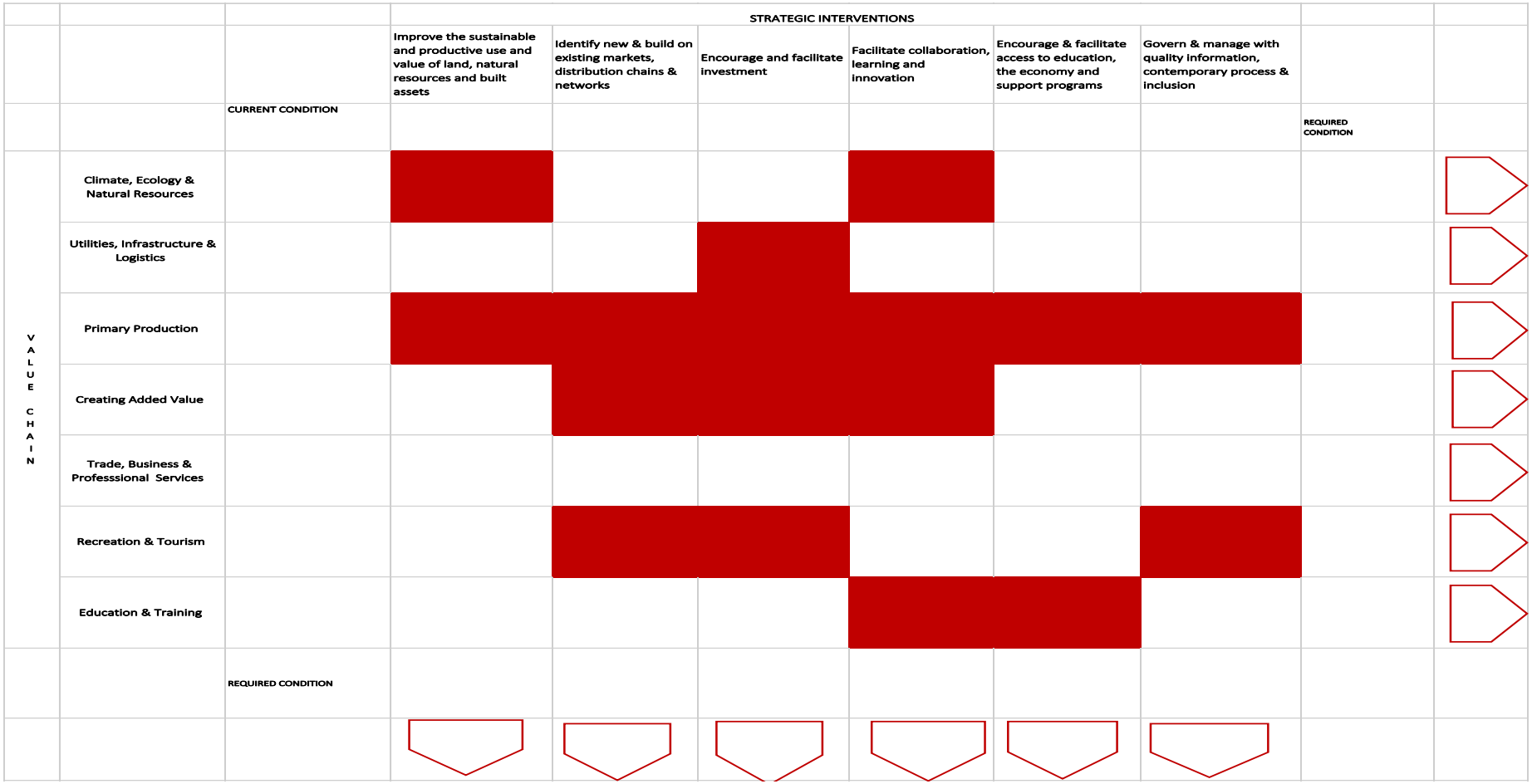


Figure 4.13 Coal Valley Summary Development Pathways



The economic zone incorporates a significant area of the City of Clarence and smaller adjacent parts of Brighton, Southern Midlands and Sorell Municipalities; it is an identifiable place that does not match administrative boundaries. As a geographic construct, considered with place-based development principles, it does not match the functional and sectoral policy and administrative silos that typify State and Federal Government portfolio and agency structures. Given these factors and indicated project participant frustration at "not being able to get all of the players in the room together" to enable either discussion or decision making, a key component of the framework was providing a focus, rationale and basis to enable the integration of strategic and day to day practice decision making and action.

The role that Clarence City Council, as primary administrator for the zone can fulfil and as was recommended, was to facilitate the strategic recommendations, in conjunction with associated councils and the Tasmanian and Federal Governments and to bridge the existing primary production and tourism industry groups to support and generate "ground up" growth and productivity improvement. The construction of two-way connections between macro policy and micro practice and their integrated decisions, investment and action was a central purpose within this. The perspectives central in place-based development, recognising the roles and complementarity of local, evolutionary development and strategic interventions is synthesised in the figure below.

Central to this is the integration of the tourism, primary industry value chains and offers, is the overarching place-based collaboration mechanism, bringing support and investment resources to the table. At each level these entities will focus on providing and supporting the interrelated factors identified below. These omni-directional relationships between leadership, practice and learning are derived from (Horlings, et al., 2018), the noted critical relationship between these factors and the role of leadership in place-based development.

Figure 4.14. Leadership, Learning and Practice Connections

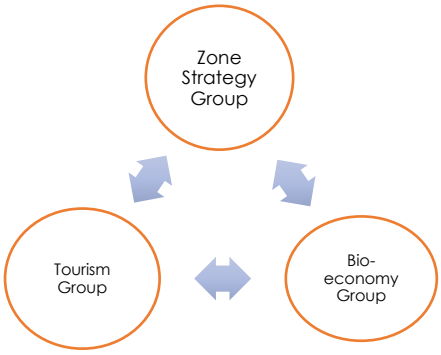
The interrelationship between the three support functions and their specific situational focus and derivatives is a critical overlay to the meta-framework, its strategic and operational dimensions and its adaptive stance. The functions are equally important at both the place and practice dimensions, the strategic, across the place and its development of both the economic drivers and enablers and from a sector perspective. This reinforces the capacity of

the meta-framework to support the development of the system overall as a brood place-based development model and also in a reductionist or sub-system form to consider a sector or strategy independently. The key is for the specific sector development options to be placed back into the place system context prior to adoption to test for both adverse consequences and also the ability to leverage further value by combining, collaborating and innovating; identifying boundary opportunities.

The group membership profile was designed to ensure the introduction and utilisation of multiple perspectives and co-design of positioning and initiatives. The proposed organizational structure and roles were designed to bring the resources and networks of key support entities, including Coal River Products Association (CRPA), Richmond & Coal River Valley Promotions (RCRVP), Clarence City Council, Tasmanian Institute of Agriculture (TIA), Irrigation Tasmania, TasWater, Skills Tasmania, Destination Southern Tasmania (DST), Hobart International Airport, Department of State Growth (DSG), Regional Development Australia, and Department of Primary Industry, Parks, Water & Environment (DPIPWE).

The proposed structure, provided below, builds on the existing Coal River Products Association and Richmond & Coal River Valley Promotions Group capabilities. It is designed to strengthen and support them to provide additional value to their members and the sectors and to provide a linking and overarching strategic management group to add value add by providing ensuring "you can get the right people around the table to work things out and ensure things happen", leadership, support and providing access to wider resources, government/industry development networks and funding. The proposed relationships between the groups are identified in the figure below and is designed to ensure the relationships are not hierarchical but collaborative at both place and practice levels.

Figure 4.15 Coal Valley Management Structure



The approach was designed to support the positioning of the Coal Valley Tourism and Bio economy Zone as a national development pilot and case study in:

- integrating the traditional and new economies;

- identifying and delivering new markets with a unique product and service mix based on its particular sub-regional characteristics, capabilities and development potential; and
- Utilising an adaptive systems meta-framework to frame and adaptively manage a place within a specific strategic context.

Conclusion

The meta-framework provided the capacity to construct a narrative based on the current condition of key elements of the economy from a systems perspective, the critical interdependencies and the strategic conclusions in terms of performance, productivity and contribution to the outcomes sought.

The meta-framework provides a representation to assist address a key concern arising from sector representatives – "getting all of the right people around the table" to productively address issues; representing their connections and interdependencies.

The explicit inclusion of productivity within the meta-framework ensured a balance in analysis between outputs and productivity, leading to the key findings of low aggregate productivity within both key sectors and the importance of developing the intangible formative capitals to complement existing physical and infrastructure assets.

National Cities Performance Framework (2018)

The Smart Cities Program is an Australian Federal Government policy initiative and program, consistent with similar initiatives globally. It is a federally developed program based on the recognition of cities as critical drivers of economic success and national prosperity. The governance of cities lies within the remit of local government, the policy and associated programs rely upon the use of federal funds linked to the programs by state and local governments. It is an example of a macro policy designed to be implemented by applying specific themes and priorities within a place-based context.

This case translates the focus and performance measures of the Smart Cities Program into meta-framework structure, followed by the specific form of the Launceston City Deal and the contribution of the University of Tasmania "Northern Transformation Strategy" to the northern region. This provides a comparative analysis of Smart Cities program as represented in a traditional program form and its representation as a meta-framework. The Launceston meta-framework and the Northern Transformation strategy nest under this program structure as complementary frameworks and sets of performance measures.

The Smart Cities Plan (Prime Minister & Cabinet, 2016) provides a range of key positioning statements, including:

> *The Smart Cities Plan provides a foundation for ongoing reform and cooperative action.*
>
> *It represents a new framework for cities policy at the federal level—and it is a framework that will guide action across various portfolios, to deliver better outcomes for our cities, the people who live in them and all Australians* (Department of Infrastructure, 2018)

A key inclusion is the introduction of cities performance data across key policy perspectives. The National Cities Performance Framework (Prime Minister & Cabinet, 2017) reinforces the basis of performance monitoring and management as a key foundation to ensuring Australia's future is underpinned by productive, liveable cities.

> *The …….. Smart Cities Plan is committed to creating the foundations for success across all Australia's cities and regional centres* (Prime Minister & Cabinet, 2017, p. 1).

The commitment is premised on governments agreeing to specific goals and interventions and the ability to measure their delivery progress and improvement over time through an agreed performance framework system. The framework is designed to support all governments to better target, monitor and evaluate cities policies and to enable continuous improvement through the City Deals.

The National Cities Performance Framework aims to:

- Help understand the context for the performance of cities
- Provide data to help users measure the performance of cities
- Support the intervention selection focus and evaluation of City Deals

The roles are supported by a range of performance indicators focused on 6 Smart City Policy priorities:

Figure 4.16. Smart City Policy Priorities

The above diagram, reproduced from program documentation (Prime Minister & Cabinet, 2016), indicates the "connectedness" between the priority policy areas and their individual and conjoint contribution to the core goal of "Productive, Liveable Cities". Performance indicators are categorised under program priority areas, recognising that some measures contribute to a range of policy areas they are included under one area only.

In addition to the above categorisation, the Performance Framework (Prime Minister & Cabinet, 2017) notes performance indicator types based on the common "program logic" sequence:

- Input
- Output
- Outcome; and
- Impact, providing a definition for each.

This progression recognises that while measures provide a point in time benchmark, a lead and lag relationship exist between many of them. This highlights the interdependency between the priority areas and the dynamics of cities.

The performance measurement report also differentiates between contextual indicators and performance indicators. The contextual indicators are identified as "characteristics or dimensions not being amenable, or appropriate for, local policy intervention". As defined, they are not specific program performance indicators but considered externalities that contribute to understanding of why the city performs the way it does and what other commonwealth or state policies might be effective in improving economic performance and quality of life. The program is silent on how an understanding of these "non-local" factors and their impact on cities can be used to inform macro-policy initiatives to address the constraints of such characteristics.

The report provides an internationally researched and set of performance measures that can provide internal and comparative benchmarks. The comprehensive nature of the set provides insight into the scope of factors that are critical in making a place, in this case a city, productive and liveable. In doing so it reinforces the need for simultaneous focus on many interdependent perspectives.

The program and report are however silent on how to utilise the indicators to help develop improved understanding of how a city works, inform multi perspective decisions that reflect the complex interdependencies within which cities operate and perform and to explain these in development policy narratives; in particular to demonstrate the return on investment from the City Deals and to send signals that will stimulate further innovation and investment. This reinforces the necessary and critical connection between leadership and support, learning and practice and how cities might use the set to progress towards their future vision.

A valuable consequence of the Smart Cities Program is that its process brings together all levels of government, industry and the community sectors; and with them multiple interests, disciplines and perspectives. The current program and performance framework, represented as priority areas and lists, while providing focus, enables aspects that are better considered conjointly to be considered in isolation, interests focusing on their specific perspectives and priorities; it loses an opportunity to establish a coherent place-based approach to the development of cities. It is however a foundation step in productively bringing people with different understandings, interests and focus together is to establish a framework to work within and a common definition of key concepts and terms.

The Smart Cities program is an example of a form of space blind policy designed to framed to a specific local context.

The following proposes an evolution of the program, its role, contribution and use of performance measures to build on the established program platform. mechanism to help coalesce stakeholders and interests through the use of a meta-framework to help represent, understand and explain how cities, and specific cities in particular work; their characteristics, how they evolve and are developed to achieve the sustainable, liveable outcomes that form the context for this policy initiative.

Understanding Cities as Places in Context

The City Deals are an important and new initiative within Australia. As indicated in the reports (Prime Minister & Cabinet, 2016) (Prime Minister & Cabinet, 2017), cities and large regional centres are increasingly dominant as economic and population centres globally and in Australia. They are also important as centres for complementary rural areas that surround them (OECD, 2018).

The City Deal is an example of framing "place-based development policy" within a national program model, a specific spatial focused policy which is in contrast to traditional "space blind policy" where a single policy instrument, e.g. company tax cuts, is applied nationally to achieve a macro-objective, without any specific adjustment to regional or local

circumstances. Place-based approaches have gained momentum globally policy as a strategic development option, the challenge is to achieve a best balance between broad macro policy and place development and to also link the performance of a place to the macro objectives.

Central to this is developing an understanding of the "condition" of the city across the key perspectives and characteristics that make cities productive and liveable. The City Performance Framework defines a set of performance measures that provide a quantifiable "picture" across these perspectives. The challenge is to then understand the interdependence of the measures and their lead- lag relationships as the basis for productive policy and operational decisions within government, the private and community sectors to move towards some "preferred future".

Connecting levels of government, key city stakeholders and the population in new ways, across disciplines and interests, necessitates a framework to achieve common meaning in language, a means of understanding interests, boundaries and the generation of innovation through the use of a representation of "the dynamic system that is a city". This framework must help people to identify and understand the complexity that is inherent in a city and its external relationships as a means of focusing initiatives and signals to explain the importance and rationale of the interventions within the City Deal and other development initiatives. Mobilising the evolutionary development component of places by this mix of signals and active demonstration can be an important, complementary component of such deals.

Complexity provides the basis for opportunity and innovation, the multiple perspectives that create the recognised challenges also create opportunities for new boundary interactions and innovation. The City Performance Framework includes performance measures and indicators that span multiple policy and priority perspectives, many of which are also important in a macro sense when aggregated between these places, in particular given the proportion of the economy and population that is linked to these places.

The operation and development of a city to deliver the outcomes identified as central to the City Deal can be viewed and understood as "self-organising dynamic systems". As identified within the report, there is strong connectivity, interdependence and specific cause-effect relationships between the policy priority areas and specific outputs and outcomes that describe the condition of a city at a point in time.

Within the system that is a city and within its key external relationships, the performance measures and indicators are "signals" to politicians, administrators, business and community stakeholders and households. People and institutions will respond differently to these signals:

- Many will focus on those of specific interest, aligned to their professional, household or agency roles;
- Some will review with little interest;
- Some will want to understand more; and
- Others will want to act in response.

The challenge is in how to:

- make the signal accessible;
- give them meaning in the context of the city; and
- provide a framework or basis for action from the signal.

Inclusion of diverse measures within The National cities Performance Measures is currently positioned as providing "scorecards" to measure current condition, progress and provide comparative analysis against specific performance indicators. Over time these can also provide the basis for understanding and explaining the "why" of the results, understanding of the critical interdependencies, cause-effect relationships, and from this understanding delivering the basis for an optimum focus on external and internal policy and practice intervention and active intergovernmental and government to enterprise partnering.

The current format while providing a foundation does not frame the measures in a form that assists in developing the deep contextual understanding that underpins optimal development policy.

The following representation of the National Cities Performance Measures as a meta-framework is designed to:

- demonstrate a progression from text descriptors and lists to a meta-framework diagrammatic representation of the program aims;
- assist in understanding and explaining the interdependence of the characteristics and measures that contribute to productive, liveable cities;
- create a 2-dimensional representation by utilising the program logic sequence identified in the program documentation as the vertical axis and an interpretation of the triple bottom line as the horizontal to improve representation, understanding and explanation of the program and its objectives; and
- Contribute to the program objective of changing the way the development of cities is considered and approached.

The process of negotiating a City Deal aims to identify where the investment of capital and in capitals will effect change in the mix of activity practice, outputs and productivity and the enabling the program's objectives. Arguably this requires an understanding of the fit between the 6 Smart Cities Program arenas, the associated performance measures and the participating city, its tangible and intangible characteristics, condition and targets that will commence the transformation towards the vision of "productive, liveable cities".

As a general approach, this can be achieved as an overlay to the regional form of the meta-framework; highlighting the connections between the program and elements and populating these elements with the identified performance measures that highlight the perspectives associated with a productive, liveable city.

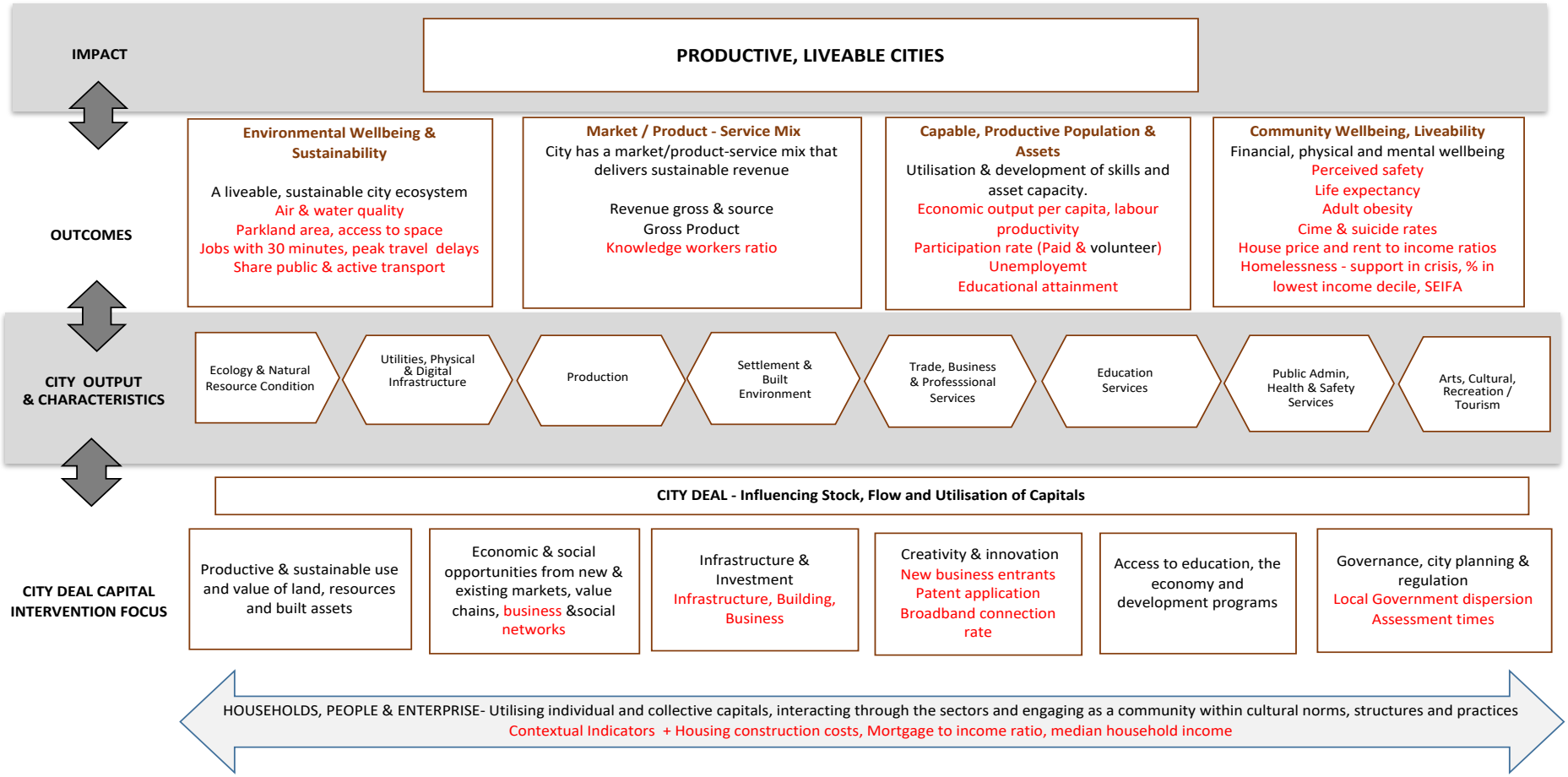
The analysis and application of the framework is structured in two halves reflective of the meta-framework structure provided in Chapter 3:

- The strategic dimension is represented as the policy goal developed by the Federal Government, the outcomes reflect the structure proposed within this thesis. These are the lagged, aggregate outcomes and impact that flow from changing day to day practice through the Smart City initiatives,
- The practice dimension reflects the short-term input/output dimensions demonstrating the connections between the 6 smart city priority areas and the economic sectors, enterprises and households that make up a city – this enables the connection between the impact of the priority initiatives on the city's population and sectors to improve outputs and build community capital to be identified.

Combining the two halves creates the dynamic systems logic to support explanation, dynamic planning and performance management founded on the Smart City Priority Areas.

The complementary National Cities Performance Measures are distributed through the system in "Red Text".

Figure 4.17 National Cities Meta-framework and Performance Measure Overlay



This overlay representation places the focus areas and performance measures into context, transforming the representation form lists to the building blocks of a "City System". Within the meta-framework construct, the 6 city priorities are distributed through the system, dissembling them (Ostrom, 1999) and applying them within a program logic construct, results in the following categorization.

Impact:

- Productive, Liveable Cities

Outcomes:

- Liveability and sustainability are a function of the interrelationship between the four perspectives; - Environmental Wellbeing & Sustainability; Market/Product-Service Mix; Capable, Productive Population and Assets; and Community Wellbeing and Liveability included in the meta-framework

City outputs and characteristics:

- Jobs;
- Infrastructure – utilities, physical and digital infrastructure;
- Housing; and
- Digital Opportunities.

City Deal Capital Interventions/inputs

- Investment;
- Innovation;
- Skills; and
- Governance, Planning and Regulation.

The meta-framework provides a mechanism to consider the fit between the City Deal focus and current and emerging policies from state and local government as they apply to the city. Inclusion of the performance measures enables the specifics of the alignment, complementarity and integration to be explored and understood as the basis for negotiation and joint decision. The scope of performance measures introduces measures that move beyond those influenced solely by investment in tangibles, such as infrastructure, to intangibles (OECD, 2018) (Productivity Commission, 2017). The degree to which a balance between these two forms of investment occur in an integrated manner is a function of the cultural frame in which "commonwealth funds" are considered; historically they have been an infrastructure project investment opportunity or some form of specific purpose crisis/gap funding. The potential to apply the program as an experiment (Ostrom, 1999) (Hoppe, 2018) in how to re-consider how the practice and development of cities is progressed requires careful design of not just the policy but how it is positioned and processed. The performance measures are important in this, the outcomes focus supports the extension of thinking and bringing important policy drivers (Hoppe, 2018), along with a range of community capitals to the fore in-line with complexity economics (Arthur, 2013). While inherent in the Smart Cities and the Cities Performance Measures material (Prime Minister & Cabinet, 2016) (Prime Minister & Cabinet,

2017), their existence and potential as "change signals" is not as apparent as when represented as a meta-framework.

The Cities Performance Framework (Prime Minister & Cabinet, 2017) performance measures are strongly skewed to outcome measures, a recognition of the Commonwealth Government and of a national policy positioning within the spheres of government and their macro positioning.

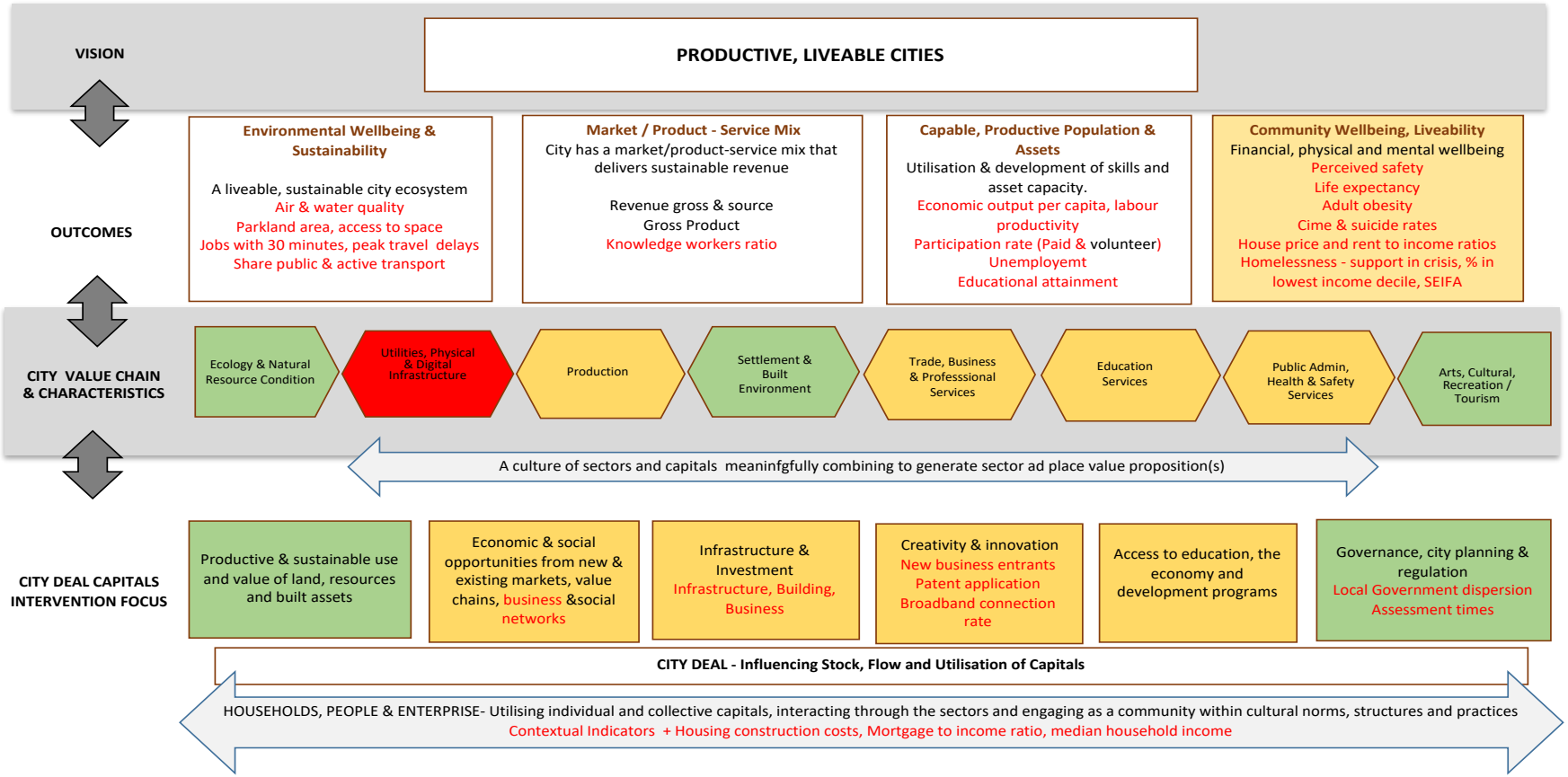
The importance of performance measures is identified (Prime Minister & Cabinet, 2017), within the concepts raised within the cities performance documentation there is a strong focus on describing and contrasting condition within score-carding, benchmarking and comparative approaches. While important, they do not necessarily support deeper understanding of either causality or relative importance of the measure/indicator. The manner in which such data is represented and complemented with output and formative information (Arthur, 2013) is critical to understanding how a city works and consequently which levers to pull and areas to tweak to progress to the Smart Cities vision. As a dynamic model the understanding of connections and interdependencies measured as comparative rates of change between them is important; this approach helps complement the recognition of connection with the degree of connection and change in the strength of the cause/effect relationship over time.

Consideration of a city as a system, enables the use of a number of business intelligence and economic techniques to complement traditional economic modelling. The meta-framework above becomes a "reporting visual", elements within the framework colour coded to reflect performance against benchmarks or specific city based targets. Within the system construct of the meta-framework, the coding of performance, e.g. for a specific outcome perspective would be constructed as a form of composite measure derived from the identified measures. The composite measures can be derived as variations to target with variables being attributed different weightings, other options include the use of rates of change between periods and other approaches to consider absolute, weights and dynamics.

The composite approach provides a mixed quantitative and visual representation and consolidation of factors "causing" the change in condition of an element within the framework for the current period can be identified in a "drill down", typically taking the form below. This utilises the meta-framework to provide a summary representation of the contribution of the sectors and formative factors to "wellbeing". From this summary form suite of drill down and analytical forms of information presentation to provide deeper understanding and explanation.

The "mock-up" below demonstrates "wellbeing" as a composite dependent variable result, derived from results drawn from a mix of performance measures associated with both the value chain and the stock and flow of capitals in a typical "traffic light" scorecard representation.

Figure 4.18 Smart Cities Performance Structure



Again, each of these elements identify their specific performance measure, change, rates of change and trend. As identified in the City Performance Measures Framework, this enables the multiple impacts of specific measures to be captured.

This form of analysis is complementary and as a prelude to formal economic analysis, identifying relationships and patterns that can be tested using more standard econometric techniques. Importantly the framework provides the basis for learning, introducing change and rapidly determining its flow through the system. Advanced analytical representations of the meta-framework are able to identify the nature of relationships between the "boxes", e.g. strength and lag periods. Such capacity supports enhanced, "what if" and scenario analysis. This provides a flexible architecture to support machine learning (Arthur, 2013) and its application to policy and practice decision making.

The relationship between a national macro policy and its impact on a city or place, is identified as important and often challenging (Varga, 2015); this connection is enabled in a general sense in the meta-framework above by providing this within the representation and through the use of the subsidiary contribution mapping and development pathways. A significant benefit comes through the potential to use the meta-framework to represent specific city deals.

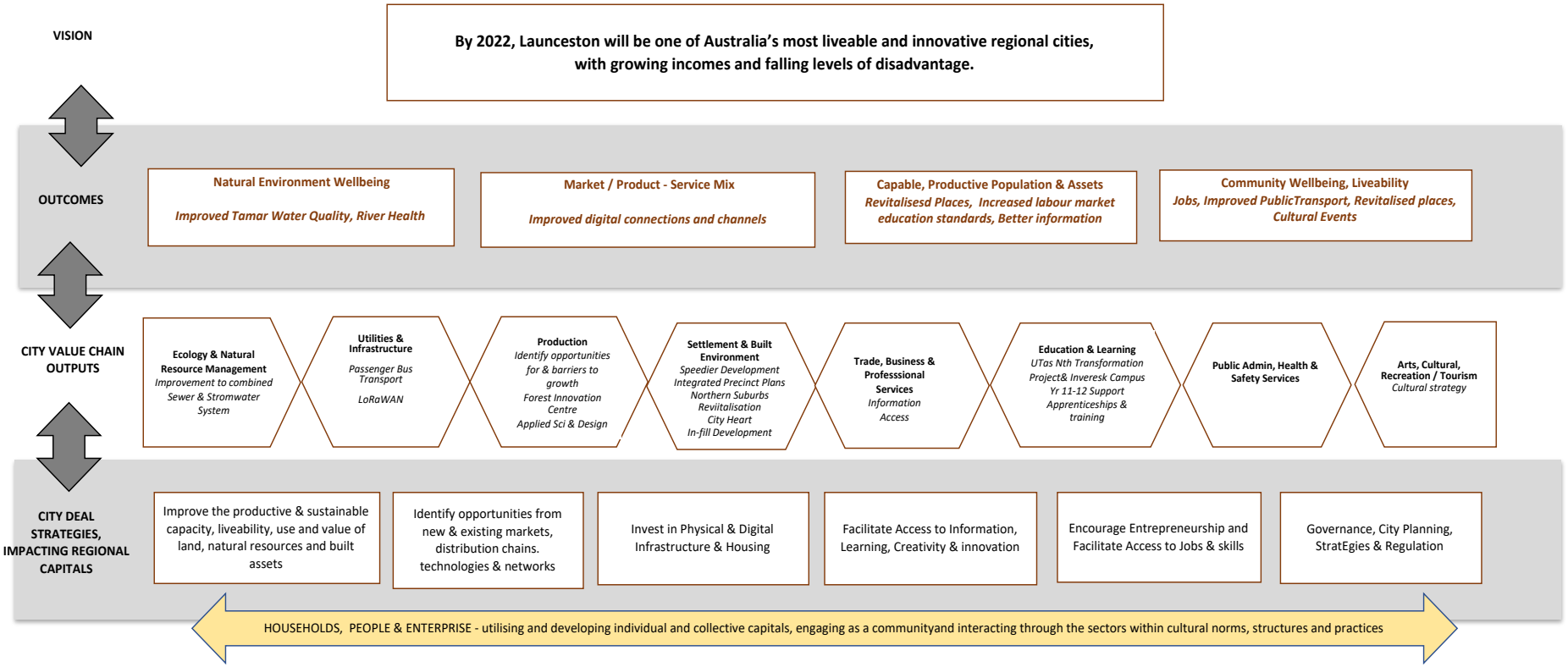
Not all cities are the same, as a result the relative importance and weighting of performance measures and initiatives will differ between them. The meta-framework is designed to help improve the focus of specific City Deals by considering the current conditions that exist within a city, their importance in that specific context and the "preferred condition". This supports consideration of the focus of the city deal, the initiatives, relative weighting and monitoring/evaluation model and criteria.

Launceston is used as an example, below. The vision and specific deal outcomes are identified as are the particular initiatives included within the Launceston City Deal (Prime Minister & Cabinet, 2017) which are summarised within the respective meta-framework elements to provide the focus and scope of the program's application in the specific case.

This meta-framework summarises and represents the specific initiatives and performance measures included in the Launceston City Deal enabling an understanding of how the interventions contribute to achievement of the outcomes and vision.

The elements of the meta-framework provide the basis to present performance, with capacity for a "drill down" to key results to enable adaptive management of the city system to progress as identified above.

Figure 4.19. Launceston City Deal - Performance and planning Meta-framework



The City Deal framework integrates initiatives from a range of stakeholders. Within the Launceston City Deal, the University of Tasmania is a major component of the deal (University of Tasmania, 2016). It is important to link and understand the role of the University within the context above; to translate the City Deal into meaning for all players and in particular to the impact of the City deal on the University and its flow-on to the community.

A "nested, complementary" meat-framework provides the means to translate the City Deal into meaning from a University perspective. This combines the purpose, ethos and focus of the University with the City Deal and its deed funding agreements.

The relationship between the University of Tasmania, Northern Transformation Project and the Launceston City Deal are as follows:

- The University Transformation Project provides a specific focus on its role within the region, captured in the "Education & Learning" element of the meta-framework; and
- In the short term it provides a major "positive shock" as an investment in the "Settlement & Built Environment" element.

The impact of construction is well documented within the benefit-cost analysis accompanying the Launceston City Deal.

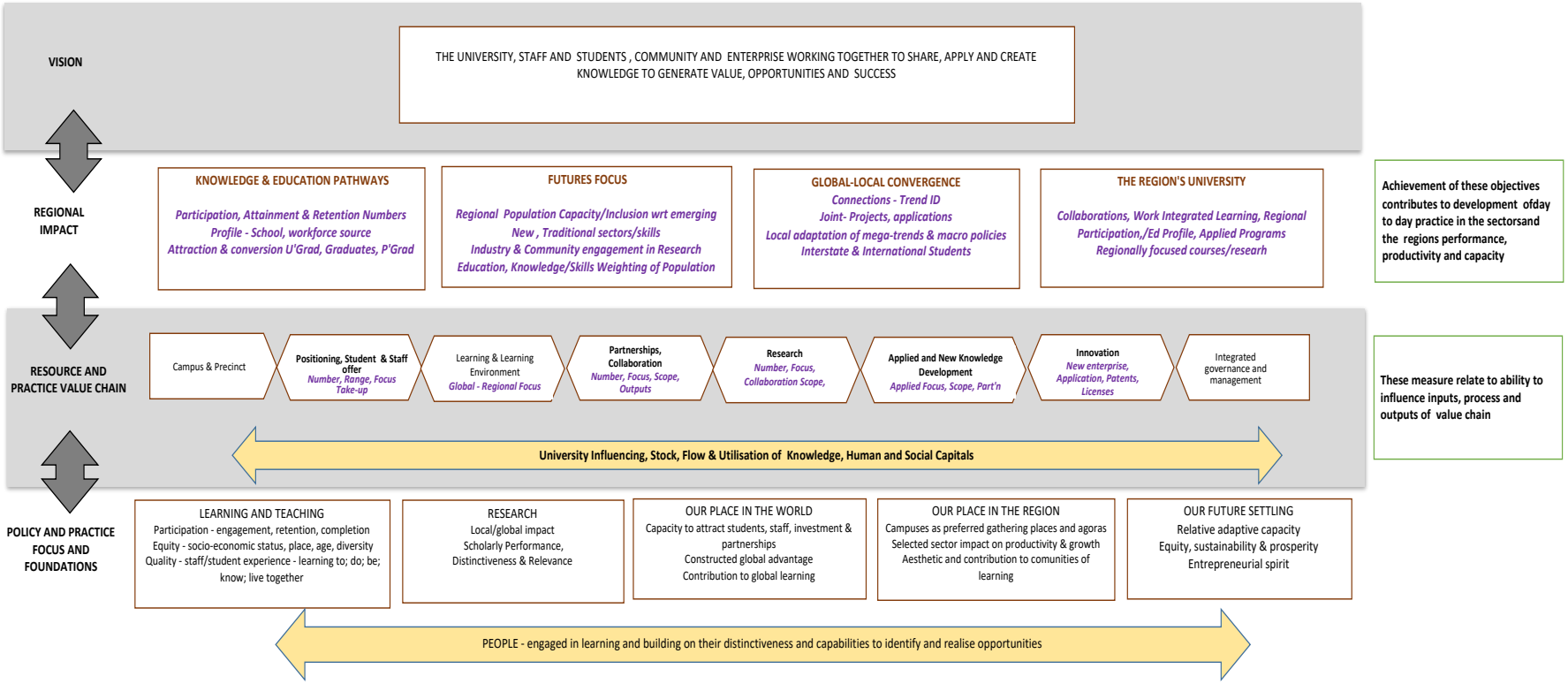
The impact of enhanced "Education and Learning" is identified within the following University meta-framework and demonstrated in the performance measures included as "purple text".

The University of Tasmania meta-framework as presented is a sub-system highlighting the role and contribution of a key stakeholder within the Launceston City Deal.

This representation and specific articulation of this contribution is fundamental to achieving internal focus within the University and for other stakeholders to understand their role as a means of supporting it and identifying opportunities to leverage further value from it.

Both of these frameworks, together with the associated performance measures and indicators, can be utilized as the basis for specific planning, implementation and evaluation and importantly to better understand how the region and city work and how initiative propagate through the system(s) to improve understanding, explanation and development of new policy and initiatives.

Figure 4.20. University of Tasmania Northern Region Transformation Project Contribution and Impact Framework



The framework aligns the outcomes sought from the City Deal with the contribution that the University can make, generating a strategic, regional focus within the University to complement the University's funding deeds. Importantly it provides a focus for schools, teachers, researchers and students within the University system to intersect their interests and fields with the outcomes sought. These signals work on a structured basis, reflected in distinctiveness and focus and also on an informal evolutionary basis on which people and enterprises make specific choices and act on opportunities.

Conclusion

The Smart Cities Program is a major initiative in the focus and approach to development in Australia. Its inclusive, multi-perspective and contextual principles are consistent with place-based policy frames developed by the OECD, Eu and the World Bank.

The National Cities Performance Framework and associated measures provide a strong evidence base to ensure the program is a productive policy intervention.

It is only a short step from the current state to ensuring the program stimulates innovation in how we think about and manage cities and other places as systems that adapt and evolve in response to government and market signals and specific policy interventions. The process within which the program is implemented is critical for the experimentation and learning contribution of policy is to be achieved.

The meta-framework approach and its associated tools provide a mechanism to assist in representing, understanding and explaining places as the basis for the integrated, productive development and management of them to achieve the productivity and liveability goals.

CHAPTER FIVE – THEME TWO: INDUSTRY IN PLACE; COMMON POOL RESOURCE UTILISATION

Introduction

This chapter explores the use of the meta-framework to the represent and explain the establishment, evolution and development of the Tasmanian Abalone Industry as an example of "industry in place". Applied in this evolutionary and a longer time-frame, it provides an opportunity to consider sequential meta-framework representations of phases that vary based on the interrelationship between the industry, the population and its interrelated values and priority dynamics as a means of representing, describing, analysing and predicting potential dynamics. This case also raises the concept of place definition and natural resource definition. Tasmania's rocky reef system provides the natural eco-system on which the abalone industry is based lies within the jurisdiction of the Tasmanian State Government. This reef system forms part of the Australian Southern Reef System, with abalone comprising part of this reef eco-system present within the jurisdiction of five state governments, each managed within these separate regulatory regimes. A key strategic question that arises is that of the definition of the primary natural resource, the abalone or the reef eco-system? The determination of this question has significant policy, strategy and practice implications.

The abalone industry provides a different policy perspective to the broad development focus of the Chapter 4 cases, it focuses on a specific natural, common use resource (Ostrom, 1999) derived from Tasmania's rocky reef system which has sustained commercial harvesting for over 50 years. (Mayfield, et al., 2012). The following provides a recognition of the importance of the strategic dimension and its dynamics over time and conditions in influencing policy and practice. It is observed that the industry has moved through three distinct strategic phases, each new phase subsuming the strategic focus of the prior into a broader perspective. Phases (1) and (2) represent the establishment and maturity phases, while Phase (3) proposes an emergent phase where the primary common use resource is considered the rocky reef system and within this, the abalone and other species within the eco-system. This provides the frame to consider the strategic policy objectives evolving from:

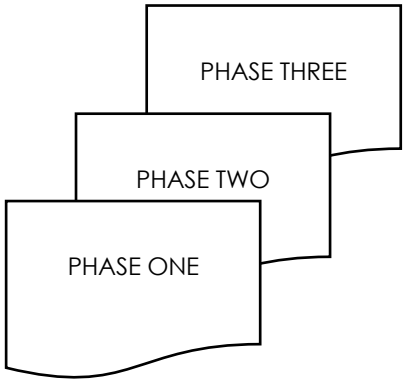
- Phase 1 – Sustainable fishing and direct incomes;
- Phase 2 - Sustainable Industry and returns on investment; and
- Phase 3 – Sustainable rocky reef eco-system supporting multiple existing and future biological opportunities.

To reflect this progression, the meta-framework as a representation of a complex adaptive system, provides a mechanism within which to consider the source, propagation and receipt of signals that lead to evolutionary and structural adaptation in the short to medium term. In the longer term, or in periods of significant shock or stress, the industry objectives and the impact as defined as strategic intent may also change, or be forced to change, to reflect the

values and priorities that frame the place, people and policy context within which the industry operates, similarly the industry value chain and scope of potential development interventions may alter to reflect changes in the stakeholder profile. These strategic and practice relationships are interdependent in an omni-directional manner.

While the meta-framework provides for lead-lag relationships within its design, this longer term, structural change can be considered by comparing meta-framework "panels" that are reflective of phases that reflect longer time and/or major value changes.

Figure 5.1. Phase Nested Meta-framework



Within this case the "meta-framework" is used to provide a comparative representation and analysis between phases, facilitating representation and an understanding of changes both within and between phases. The following application of the meta-framework to the Tasmanian Abalone Industry is consistent with the notions of place as applied to the coastal marine environment, in particular in its positioning which evolves from a essentially hidden host to a stock of abalone, through to considering it as an environment to be protected in the same manner as terrestrial environments to then considering Tasmania's rocky reefs as part of the Australian Southern Reef System and its potential to be considered as a common pool natural resource with the abalone industry being a sub-system within this construct.

Background

The Tasmanian Abalone Industry emerged in its modern iteration in 1963, from a commercial export opportunity coinciding with access to efficient, low cost diving equipment; this foundation has sustained a wild fishery since that time.

The Tasmanian abalone industry is an example of an endogenous industry that reflects place and the associated alignment and utilisation of natural and developed capitals and their attributes to develop outputs and/or services that productively meet the market. Governments intervene at times and under specific circumstances, to alter conditions to meet the parameters for commercial success, usually on the basis of potential flow-on employment and income benefits within the place. This benefit can be direct, in-direct or induced from investment in change.

Economies are both stimulated and evolve based on the signals given and received, the meaning taken from these signals is aligned to culture, values and from this norms and practice. The political dimension and associated narratives associated with condition and development adapt to reflect dominant or contested values in the "place" and at the scale of government intervention. In Tasmania, the utilisation of natural capitals has motivated government and community interventions from the early 1800s, however it achieved global notice in the 1970s with wild place protection protests and has been evident in and influenced by the resultant community and agent interest since that time.

There are other arenas where the question of the role of an industry within a place does not gain a priority agenda position for many reasons including:

- Low visibility and awareness;
- Lack of physical or emotional connectivity with a large sector of the community;
- Management and policy consideration that has evolved linearly and incrementally from the original proposition, by default or design shaping the questions around it; and
- The industry structures and power relationships.

The challenge in considering the contribution, appropriateness, adequacy and sustainability of industry in a place, in particular those based on natural resources in public ownership; is how to constructively and productively identify and manage appropriate policy and strategy in response to questions around these concepts.

The coastal marine environment is an example of an environment:

- in close proximity to the majority of the Australian population;
- where ownership lies in the public domain;
- that provides major economic contribution to Australia; and
- is under sustainability pressure from pollution. climate change and fishing.

While specific places, such as the Great Barrier Reef, appropriately receive close scrutiny and response, other coastal marine environments and their condition determinants are managed (or not) as a consequence of and within reductionist, linear management structures. An example is the Australian Southern Reef System that spans the Australian Coast from northern New South Wales, Tasmania and through to Western Australian coast in the Indian Ocean. In 2015, the value of economic production from the Southern Reef System was identified as $10b (Bennett, et al., 2016).

Unlike the rural and regional development cases in the previous applications of the meta-framework, as outlined in Chapter Four, this application is unresolved from an adoption and implementation perspective, it was initiated as a means of positioning and explaining the rationale and feasibility of "re-seeding" abalone beds as a means of increasing the commercial sustainability of the industry for an abalone diver and on-shore abalone farm owner's proposal to re-seed the eastern Shore of Bruny Island with juvenile abalone bred from stock harvested from that same location as an intervention to:

- Recover stock levels on that shore; and

- To reduce harvest pressure on other "harvest blocks" around the Tasmanian coast-line; and
- To improve the ecological sustainability and economic productivity of the industry.

The proposal was at the time (2014) rejected by the Industry body, "The Tasmanian Abalone Council" and did not proceed to consideration by the regulatory authority. However, in raising the potential and analysis of biological and financial feasibility, it has highlighted the on-going, longer term sustainability of the "wild catch" form of the industry and the policy framework under which it operates. Reseeding abalone harvest beds is now subject to industry initiated feasibility analysis, with the use of farm bred, juvenile stock one of the options under consideration. (Lisson, 2108)

This initiative motivated further questions in relation to the focus and system within which the stock of abalone within the reef system has been managed since the inception of commercial harvest in the 1960s and into the future. The multi-generation timespan facilitates consideration of the application of the meta-framework approach to accommodating the dynamics of structural changes across multiple dimensions and perspectives and aspects of contestability. Multiple generations of people engaged in and with the industry, leads to consideration of the impact of changing characteristics, values and priorities and behaviours within the industry.

In contrast to the applications summarised in Chapter Four, the fifty-five year time horizon associated with this industry potentially impacts the broad value proposition of the industry – the contribution of the industry to the place and its alignment to societal values and priorities. The strength of the alignment between industry and societal values and goals potentially impacting the defined strategic vision that sets the context for industry management and definition of the outcomes necessary to achieve this intent, changes the top half of the meta-framework driving change in scope and intervention at the operational dimensions. The progression in the industry's strategic intent is identified as:

- Phase One, initiation and establishment - a new opportunity, based on new diving technology, adventure and the ability for young people to turn little into significant wealth, alongside and with a fishery agency determined to manage for an orderly, sustainable catch;
- Phase Two, Industry Maturation - external investors, tradeable assets, 1995 the introduction of the "Marine Living Resources Act" legislation to promote the framework for management of multiple species and the protection of marine habitats; and
- Phase Three, industry in place – an emerging, broad focus on the condition of the reef ecosystem as a consequence of wider awareness of externalities such a water temperature increase, species migration, the health of the reef system and an understanding of the interdependency of both species and externalities in ensuring the system can support its ecosystem, including commercial species.

This progression highlights questions of changing focus and values and a widening of interests from:

- an initial single species harvester/fishing controller focus; to
- a multiple species, resource and eco-system-habitat management perspective; to
- A broad, community interest in environmental, economic and social benefits and cost perspectives.

Each phase reflects a function of change in thinking, values and practice that is a temporal and political evolution; providing a challenge in developing policy and managing for the long term and the pre-existing and emerging interests.

This application is provided as a mechanism to place phases (1) and (2) into a dynamic systems meta-framework to represent and explain the establishment and trajectory of the industry and to propose phase (3) as a potential framing based on emerging signals.

Phase One – Initiation and establishment

Two species of abalone occur in the Tasmania waters: Haliotids rubra (blacklip abalone) and Haliotis laevigata (greenlip abalone). Both species are mobile bottom dwellers that graze on drift seaweeds and algae on rock surfaces. They occur on rocky bottoms, mainly within the littoral zone from depths of five to thirty meters, although they can be found down to around 40 meters (Department of Primary Industries, Water and Environment, 2000). Blacklip are the most abundant and widespread species, forming the majority of the abalone harvest.

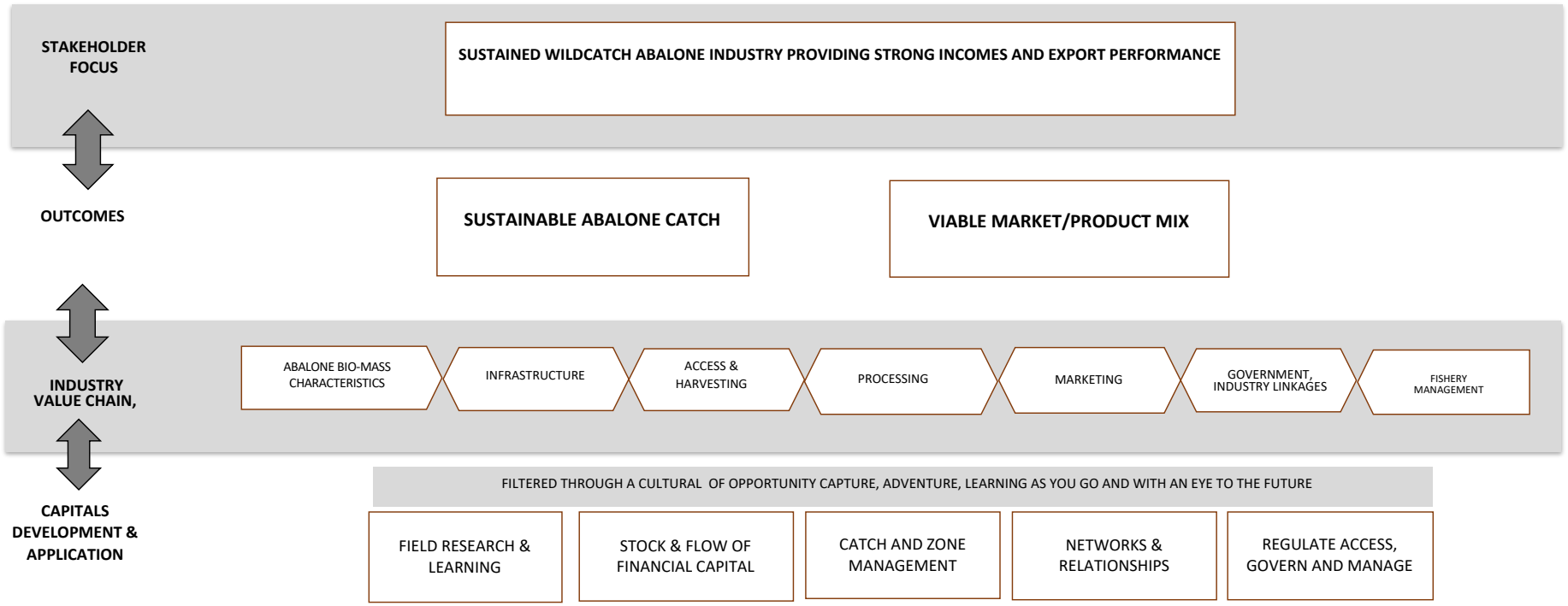
At different times and for different people, abalone has formed both a staple within diet and a high value delicacy. Coastal tribes within Tasmania's indigenous population consumed abalone, amongst other shellfish, harvested by women and cooked with the shell (Harrison, 1985). Chinese fishermen established an abalone fishery on Tasmania's East Coast during the mid 1870's, harvesting and drying the fish for miners in Victoria, a trade that collapsed in the 1890's as a result of Chinese population decline subsequent to a landing tax being applied by the Tasmanian Government in response to Trade Union pressure (Harrison, 1985). Commercial fishermen based at Southport fished for abalone as a source of income when alternate fishing was unavailable.

The following meta-framework representation of the initiation and establishment phase of Tasmania's abalone industry reflects the characteristics of its emergence as framed by its attraction of new entrants to fishing, their willingness to work with new, collaborative management approaches, the ongoing tensions of a them and us fishery regulatory/compliance system based on policing and reactionary management and people who recognising their lack of knowledge of the harvested fish threatened the longevity of the industry.

This representation reflects the interests and stance of the initiation stakeholders - new divers/fishers, existing food processors and the fishery regulatory authority, their activities, individual and combined values and objectives and an impact, while not formalised,

reflecting the focus of the relatively narrow group of key stakeholders. The application and development of capitals is applied through this cultural filter.

Figure 5.2. Phase One, Industry Initiation and Establishment Meta-framework



Following an aborted attempt to establish a fishery based on exclusive harvesting rights to an area of the identified fishery to supply canning processing in the early 1950s, spasmodic diving surveys by both the Fisheries Division of the Department of Agriculture and the CSIRO Fisheries Division identified significant abalone beds in the lower D'Entrecasteaux Channel and Acteon Islands; culminating in the provision of 200kg of abalone to the Dover Fisheries factors in 1960 to enable market testing. In 1962 abalone canning, using supply caught by week-end divers was commenced and by 1963 exports to the Chinese and Japanese markets had commenced for both canned and frozen product, attracting the interest of major food processing companies.

The emergence of reliable, lower cost diving equipment and of recreational diving resulted in an abalone harvesting community comprising both professional divers and licensed "week-end and holiday divers", many of whom made the transition of full-time abalone harvesting.

The Fisheries Division of the Tasmanian Department of Agriculture was the responsible entity for the abalone industry and other fisheries, rock lobster, scallop and fin-fish. The emergence of commercial abalone harvest followed a turbulent period in the management of the scallop industry and consequent challenging relationships between the industry and the division; this new fishery provided the opportunity for the division to develop a management model that went beyond regulation.

This stance provided the formative principles for a high degree self-organization within the industry (Ostrom, 1999), particularly if government is perceived as resource owner as well as regulator, integration of technical and practitioner knowledge and policy as experimentation and exploration (Ostrom, 1999) (Hoppe, 2018) as the basis for creation of joint knowledge.

The new industry provided the opportunity to design an enduring management model based on the integration of:

- Co-operative management;
- Research; and
- Regulation.

The notion of co-operative management was at odds with the tradition of the Fisheries Division as a regulator in tension with the fisher. The foundation of this fundamentally different culture was enabled by:

- New (& younger) entrants as divers who had little of the traditional "them & us" culture of many of the traditional fishers;
- Influential leaders from the tradition fishing industry and senior public servants urging the Minister to be pro-active in managing the new industry;
- Processors recognised the harvest and product needed careful handling to realise its full value;

- Divers had unique ability to see the whole stock and many were fascinated by the problem of how to husband the resource, that even in early days seemed (financially) valuable;
- All parties began on an equal footing; and
- Their dependence on government research through the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (Harrison, 1985)

People, Industry Stakeholders & Culture

The commercial abalone industry was born from individuals who adopted the new, lightweight diving equipment, including the adaption of regulators to surface supplied air as their entry to this new form of recreational diving and harvesting of abalone and rock lobster and their subsequent, initial sales of small quantities to fish processors. This coincided with larger food processing firms actively searching for new export opportunities.

The efficiency of this harvesting method resulted in the banning of diving as a method of rock lobster harvesting (Harrison, 1985). Fishers from the traditional sectors soon also developed an interest in the fishery.

The rapid development of the commercialisation resulted in the Fisheries Division of the Tasmanian Department of Agriculture to quickly engage and develop a commitment to the management of the fishery to achieve steady state harvest that ensured sustainability of the stock.

The limited number of stakeholders, commonality of interest and the acceptance of the principle of sustainable harvest, in the face of low levels of knowledge of abalone as a species, its dispersal and factors affecting its viability, led to a wide recognition of the interdependency of an evidence based policy and regulatory framework based on stakeholder knowledge and engagement. This "newness", shared interest in the recognised opportunity and challenge formed a strong foundation for the initiation and establishment of the industry.

The initially limited numbers of people and stakeholder groups, their beliefs and attendant approaches and behaviours formed the manner in which the value chain operated and defined the mix and focus of the policies and strategies identified, were adapted and adopted. This cultural and resource utilisation nexus remains strong and critical to the consideration of industry in place.

As these original participants left the industry and were able to sell/transfer licenses, the consequences of the licensing system, the numbers of licenses and therefore the scale of the licensee revenue, and the attraction of more diverse interests became apparent in the high capital value associated with the perpetual right to harvest abalone. The flow-on from this increase in fixed cost for subsequent participants leading to other mechanisms that separate investment from the catch activity. This consequently led to changes in the scope of the system and the dynamics of the connections. These dynamics are considered typical of the adverse consequences and on-going compensatory interventions when highly bounded

issues, rather than systemic consideration, form the basis of policy. The flow-on of a proportion of this capital gain to become the founding stock of investment for emerging opportunities in vineyards, tourism and aquaculture is considered serendipitous. The success of these industries and the benefits accruing to Tasmania from continuity of the innovative culture of these participants reinforces the critical nexus between innovation and the growth of community capital stock, at times supported by government derived semi-monopoly creating interventions.

The Market – Product Mix

The indigenous, coastal tribes collected abalone as part of their diet, cooking them "in shell" in an open fire; this preparation did not meet the palate of Europeans and whilst it was known as a potential food, abalone was ignored until Chinese fishers harvested it to sell dried to Chinese Communities in Victoria.

The commercial wild abalone industry in Tasmania was initially and primarily based on sale of frozen and canned cleaned abalone into the Asian market. In the early 1980s, around 74% was frozen product to Japan, this product slowly declined in popularity, replaced by canned abalone until the introduction of live abalone exports in the mid 1990s (Mayfield, et al., 2012), growing rapidly to become the dominant form of export by 2011, primarily to China, via Hong Kong.

Networks, Relationships and Management

The cooperative model was initiated from an informal meeting of senior fisheries inspectors, some fishers, and processors and a few divers (Harrison, 1985) at the Fisheries Division offices to trade information and canvass ideas. This led to the formation of an Advisory Group in 1963 that initially identified that: (Mayfield, et al., 2012)

- The fishery needed to by quickly regulated;
- All divers needed to be identified, and hence licensed;
- An increase in minimum harvest size limit to 6 inches to provide added stock level insurance subject to more sophisticated management;
- Introduction of regulation to ensure that all abalone should be landed live in shell rather than shucked at sea to better ensure harvest quality and control minimum size limits.

The Abalone Divers Association was formed in 1964, arising from protest to the recommendations becoming regulation and the impact on their business model and practices, in particular the requirement to land abalone live, in shell.

A further Agriculture Department conference in early 1965 provided the opportunity for the industry stakeholders to raise specific issues. Attended by processors, the Abalone Divers Association and key players from the fishery, it also includes the manager of the Tasmanian Government Trade Promotion Branch, signalling the interest of government in the growth of the industry. This form of engagement and associated decision making remains in place.

The conference supported the proposal for detailed harvest returns from divers and processors (Harrison, 1985). The diver return provided a daily record of fishing area, catch and diving effort, within identified "blocks" of coastline., in 1966 processors commenced provision of monthly returns identifying catch purchase and names of supplying divers. The certainty of these records as a research tool was reduced by continuance of shucking the catch at sea. Tis was off-set by the continuation of "shucking the catch at sea" for a period until early 1967 when the impact of this practice on both product quality and size control was recognised with the regulation to land catch "live in shell". The introduction of measures, to be used prior to removal of the animal from the rock was considered by Harrison as a major step forward in dive practice.

Field Research & Learning

The unique opportunity to research the fishery prior to any significant harvest was recognised (Harrison, 1985); consequently both on vessel monitoring and measurement of catch occurred along with a tagging program, harvest experiments and scientific research to determine size at maturity and spawning seasons on what were identified as relatively untouched reef locations on Maria Island on Tasmania's East Coast (Harrison, 1985).

Fishery research commenced with the initial exploration of the potential of abalone to form a fishery (Harrison, 1985), initially with sampling and commercial logbooks, evolving into more structure sampling biological, and catch effort (Mayfield, et al., 2012) as part of the establishment phase. The establishment of the Fisheries laboratory at Taroona in 1971, a dedicated research vessel, monitoring fishing returns and measuring catches and a cooperative fishery management process provided enabling base to the achievement of a sustainable fishery.

In 1977, the Fisheries Development Authority was formed with a mandate to develop new and expanded fisheries, with a specific focus on increasing the volume and value of demersal fish, mussels and scale fish and aquaculture, in particular in abalone culture. The focus on aquaculture and trawling replaced the focus on the wild abalone sector research for a number of years. The Development Authority was disbanded in 1982, the intervention highlighting the vulnerability of industry development and research to changing political priorities.

From a meta-framework perspective, this inclusion within the role of government provides a potential tension with the regulation of catch role, in particular when operating in an open competitive market where price advantage is a challenging strategy to implement.

Access Management

New rules to reflect the Advisory Group recommendations were announced in December 1964 with:

- A 10 pound license fee for commercial divers and 1 pound for recreational divers
- The 6 inch minimum size limit; reduced to 5 inches in 1965

By 1966, 144 divers were licensed to commercially harvest abalone. The catch had achieved 1,000 tonnes (live weight), but in doing so some locations, such as Tasmania's East Coast had significant reduction in harvest productivity; to the extent that interest in farming abalone had developed. By 1967, the numbers had swelled to 247 commercial licenses with a shelled weight of 1,000 tonnes, in a short number of years it had become Tasmania's second most valued fishery.

The relationship between diver numbers and catch was considered a catch volume determinant, despite many of the divers operating on a part-time basis. In 1968, commercial dive licenses were only available to those who had been licensed in 1967 and the annual fee increased to $100; this resulted in 102 licensed divers, with a stable catch of around 1,000 tonne (cleaned) for the next couple of years (Harrison, 1985), however this was identified to be price, rather than effort related.

In 1969, the Tasmanian Government limited the license numbers to 120 and made them available only to Tasmanian residents with commercial fishing experience (Department of Primary Industries, Water and Environment, 2001). This initiative was designed to prevent excessive fishing, establishing a policy nexus between the number of fishers and sustainable fish stocks. The theoretical nexus was challenged by the practice of some licensed divers carrying unlicensed divers to catch from their vessel and their behalf, a risk to stocks that was legislated against in 1971, when the practice was prohibited. Identification of licensed divers was made easier in 1979 with the introduction of an identification card. Recognition of anomalies within the Furneaux Group harvest zone led to an increase in of 5 licenses and a total of 125 licences for Tasmania.

In 1974, approval was given for a retiring diver to transfer their license to their nominee on the basis of health risk as long as they had held the license for 3 years. This was the result of a number of years consideration of the challenge of bringing new licensed divers into the catch system in the face of divers wishing to retire, including those who were suffering diving induced illness (Harrison, 1985). The Tasmanian Government had adopted a position of allowing sale of entitlements to use a boat in the lobster fishery, however the abalone license was a personal license, unable to be transferred; a new diver, was a new person issued with a new licence. After a number of propositions, attempts and opinion contests between divers, their associations, processors and legislators, along with increasingly obvious detrimental health impacts and public sensitivity to abalone divers reaping significant financial reward from these sales; resulted in the matter of "sale of entitlement" escalated to involve the "Premier", the leader of government in Tasmania and the decision to allow this transfer. The transfer was conditional; new applicants had to pass a medical examination, been domiciled in Tasmania for 2 years and preferably be form the same geographical area as the transferring diver. The transferring diver health pre-condition was later withdrawn

This transfer decision was the catalyst for major change in the structure of the industry. This change was accelerated by the introduction of quotas attached to licenses and their limited transferability. In 1985, the following mechanism was introduced:

- Establishment of 3,500 quotas;
- Each of the 125 licenced divers being allocated 28 units; and
- Each quota having an allowable catch of 1 tonne of abalone.

Given disparities in catch levels within the Furneaux Group, the allocation for each of these 5 licenses was reduced to 20 units. This resulted in 3,460 units with a catch per unit of 1.1 tonnes and a resultant aggregate total allowable catch of 3,806 tonnes. Each of the 120 Tasmanian Mainland divers was able to transfer 12 units to another diver for the season, allowing limited transferability. Furneaux Group divers could only transfer quotas to other group divers. In 1990, the differentiation between Furneaux group divers was eliminated and their unit allocation increased to 28 to match the balance of the divers.

In 1990 a review of abalone license arrangements confirmed that:

- Abalone licenses were valued at approximately A$1 million;
- They were not recognised by formal lending institutions as collateral.

This resulted in the abalone dive license being split into 2 components:

- A licence to dive; and
- A licence to hold abalone quota.

This was in effect a lagged legislative change, reflecting the evolution of the business model where increasingly divers leased their licenses from former divers, processors or other financiers. Effectively a diver could harvest abalone from their own quota or with the authority of a quota holder. Quota ownership or levels of ownership were now unrestricted, the formalisation of this change to the Fisheries Act 1959 in 1993 formalised the Tasmanian Abalone industry to a fishery managed on an individual transferable quota (ITQ) system (Department of Primary Industries, Water and Environment, 2001)

The security of these quota assets was reinforced in 1994 with the introduction of contracts in the form of "Abalone Deed of Agreement", a 10 year agreement (or right to harvest) with automatic right of renewal. Associated with this deed was an escalating fee structure based on a proportion of beach price designed to fund both fishery management and provide a return to the community.

This evolution of the abalone quota, while allowing wider investment in the industry (by 2006/7, 450 people held quotas) it also created the potential for a formal and perpetual disconnect between the right to harvest and active engagement with the fishery and its eco-system and heightening the focus on return on investment from the investment asset. This separation led to high number of lease divers and through the co-management approach to the industry quota owners overweighting the influence of the catching sector (Mayfield, et al., 2012).

Total Allowable Catch & Zone Management

The Fisheries Division of the Department of Agriculture commended its engagement with the industry on the basis of aiming for sustained and sustainable catches attempting to achieve a

steady state fishery, markedly different to the cyclical pattern demonstrated by the scallop fishery.

The Fisheries Division aimed for nominal harvest levels it considered likely to ensure harvest sustainability. While aiming for sustainable, but unknown catch levels, the early intervention was to establish minimum size limits and to manage diver numbers. This limitation concept was further reinforced in 1971 when the requirement for only licensed divers to be allowed to dive for abalone from a vessel engaged in abalone fishing was introduced (Mundy & Jones, 2017) ensuring the effort limits were to some degree controllable.

On-going changes were made minimum size limits until 1985, primarily increasing size limits and penalties for under-size and illegal harvest (Department of Primary Industries, Water and Environment, 2001). However, concerns of overfishing risk resulted in the introduction of a quota system in 1985, a model that has continued. The initial "total allowable catch" in 1985 was 3,806 tonnes, in the four years 1985 to 1989, this system was used to reduce TAC to 2,076 tonnes. In combination with reducing the minimum size limit facilitated stock rebuilding and led to a 22% increase on quota in 1997 to 2,520 tonnes (Mayfield, et al., 2012)

In the year 2000, fishing zones were introduced to the abalone fishery in response to catches becoming increasingly concentrated in some parts of the fishery, primarily the East and South-east coast (Department of Primary Industries, Water and Environment, 2001). The geographic zones and subsidiary "blocks" were used to allocate catch limits and different minimum size limits to reef locations based on the harvest records and their dynamics; zone boundaries have been adjusted to reflect new knowledge.

Stock & Flow of Capitals

Industries vary in their proportion of labour, capital and material resource requirements. The wild abalone fishery was established on low barriers to entry and utilised existing processing capital to provide a product based on the "canning" capacity of the processing sector.

Once amateur fishers, utilising small boats or chartering larger vessels, identified the potential, traditional fishers with larger vessels were also attracted to the fishery as a more profitable venture than other fisheries provided.

The Tasmanian Government's decision to allow abalone dive licenses to be transferred established a market for licenses based on their capacity to generate income based on the limit of 120 licenses across the fishery. The aggregate value of dive licenses transformed into a stock of capital value associated with license holding, creating a major flow of capital into and out from the industry. Abalone processors identified the value of surety of supply and became financiers to new entrants and through their business model, beneficiaries of the rise in value of entitlements (Harrison, 1985).

Exogenous Influence and shocks

In February 1971 the Fisheries Division received reports of dead and dying abalone on West Coast in-shore reefs, processors were identifying losses during transport. The losses were

attributed to warm water from the East Coast Current sweeping through Bass Strait and down the West Coast raising water temperatures from February through April to 18 degrees Centigrade, coinciding with very calm condition to result in lowering oxygen levels to lethal concentrations (Harrison, 1985).

This event signalled the vulnerability of the fish stock to water temperature change. Catch levels were not the only variable at play in ensuring a sustainable catch.

Almost totally dependent on export markets, abalone is also dependent on the US$ and A$ exchange rate. The establishment period occurred within a regime of fixed or pegged, exchange rates. At the initiation of the industry, the Australian currency was pegged to the UK pound, changing to a peg against the US Dollar in 1971, despite major currencies adopting a floating exchange model in the early 1970s. Australia initially adopted systems pegging the value of the A$ to the county's Trade Weighted Index (TWI) introducing incremental changes based on change to the TWI until a floating exchange rate regime was adopted in 1983.

In moving towards the maturity stage, the industry found it needed to consider how it adapted to currency and therefore value uncertainty and to develop the agility to adapt to what have been cycles of significant volatility in the exchange rate between the A$ and the US$ as the currency of international trade.

The initiation and establishment period occurred in a period coincident with the emergence of bi-lateral and regional trade agreements and their potential impact and benefits to the export.

Conclusion

The industry was well established, it was generating major income from a previously latent, endogenous economic resource, it was co-managed through a culture of collaboration between industry and government, however issue of continuity beyond that of sustainable harvest were emerging as major policy and governance challenges.

The Tasmanian abalone industry was being forced by external shocks to consider more that sustainably harvesting abalone and selling them through pre-existing processing capacity and techniques into a market with few competitors.

The mix of stakeholders, the pioneering and learning culture had initiated an industry that soon attracted wider interests because of its high revenue potential and consequent market derived and legislatively created capital growth. Research based co-management and a willingness to adopt measures to achieve sustainability provided a base that led the industry towards a mature state.

The progression outlined in this initiation and establishment phase across the establishment facets of the fishery resulted in a significantly altered and dynamic industry with significantly changed characteristics, in effect it had evolved and through specific interventions into a mature stage. There is no event or date that marks the however, by the mid 1990's the

characteristics of initiation had disappeared or transformed into a professional investment, business and industry structure.

The industry was managed on an issue by issue basis, reacting as they arose, with government intervening through adaptive regulation and transitioning from a regulator to an industry developer role, and back again, in what had become an industry with a high capital base.

When considered as a CAS as represented in the meta-framework, there is a clear increase in the scope of the building blocks that represent the industry as a system in place. This occurs as a consequence of the change in components; participants, positions, actions, outcomes, transformation functions linking actions to outcomes, information and payoffs (Ostrom, 1999) that emerged through a combination of natural replenishment, policy and market forces.

The comparison also highlights the transition of research and regulation from attempting to establish a benchmark of sustainability of supply across a rocky reef eco-system that was not homogenous, to one of policy/regulation as an ongoing experiment utilizing a mix of total allowable catch, size limits and catch levels by location as the regulatory mix; an adaptive regulatory process reflecting the Ostrom CAS principle.

Phase Two – Industry Maturation

The Phase Two meta-framework provides a representation and basis for analysis of the industry as it matures into a typical industry model that is open to a diverse range of investors who enter with an expectation of real returns. There was no point at which the industry moved from one phase to the next, the scope and focus of the elements at the establishment phase were augmented and change in focus as a consequence of additional connections, increasing diversity of interests and associated dynamics.

The Tasmanian wild catch Abalone Industry has sustained a wild catch fishery, producing one of Tasmania's premium seafood products for over fifty years (Mayfield, et al., 2012). The catch level has varied significantly over this period, from around 50 tonnes in 1964 towards 2,000 tonnes by 1967, 3,500 tonnes by 1971, the abalone harvest trajectory rising from 1975 peaking in 1984 at 4485 tonnes after which the introduction of structured fishery management saw it decline and follow a relatively stable pathway until 2009 when major decline became evident. The 2015 harvest was set at 1820 tonnes (Mundy & Jones, 2017).

By this time the industry had transformed in structure from a small number individual, exploratory initiators and a regulatory authority into a fishery structured around a global export market that now included professional and corporate investors, industry focused organisations and the strong emergence of industry development and management – a reflection of professional commerce and public administration and policy.

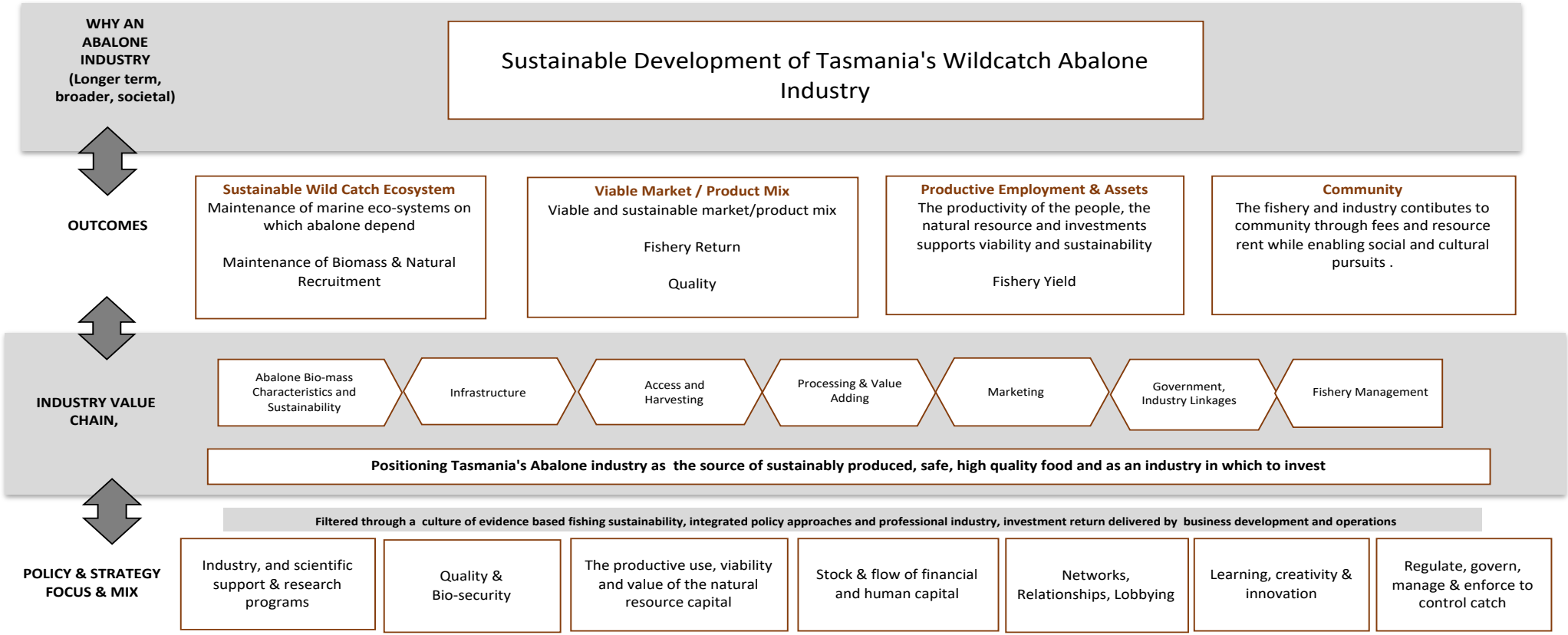
This context resulted in significant structural change to the scope and focus of the industry, as represented in the Phase 2 meta-framework below. Comparison with the initiation and establishment phase highlights significant change in the participation, values and culture underpinning and in the long-term aim, associated with this phase. As a consequence, the stance in relation to the interventions, to the value chain and outcomes sought vary.

The industry framework now derived from legislation; the *Fisheries Act 1959* was replaced with the *Living Marine Resources Management Act 1995 (Tas)* (LMR). This piece of legislation was enacted within the policy context created by Schedule 1 of the Tasmanian government's *Resource Management and Planning System* (RMPS). The RMPS is positioned as "an integrated system, with a number of provisions in these Acts requiring that specific functions must 'seek to further the objectives of the Resource Management and Planning System' (RMPS) (EPA 2018). Within this context the LMR objectives include achieving sustainable development of living marine resources and protection of the marine eco-systems; having regard to the need to:

- increase the community's understanding of the integrity of the ecosystem upon which fisheries depend;
- provide and maintain sustainability of living marine resources; and
- take account of the community's need in respect of, and community's interests in, living marine resources.

In conjunction with the sustainable industry development focus of the RMPS, these become the outcomes sought from the application of a policy and strategy mix that reflects this focus in the manner it is applied to the industry value chain. The evolution and development of the industry into a state of maturity following its inception and establishment phase is represented in the meta-framework below.

Figure 5.3. Phase Two, Industry Maturation Meta-framework



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The difference between the establishment and the maturity phases is significant. Phase 2 reflects the evolution and development of the industry through policy, market and agent intervention.

This places the industry within an economic stance based on sustainable development principles articulated Schedule 1 of the RMPS as the frame for the outcomes and impact sought from the industry and its supporting public policy and industry endeavours.

This section of the Chapter is structured to reflect the strategic outcomes identified above, linking the mix of policy and strategy enablers and interventions with the value chain in the context of the people, industry stakeholders and culture on which the industry is based.

People, Industry Stakeholders and Culture

The fishery altered significantly in 1985. License holders were allocated "Individual Transferable Quotas" (ITQ), with each of the 125 general licensed divers allocated 28 units of quota. 1991 saw the restructure of the license system, uncoupling the diving entitlement from the entitlement to hold quotas and the upper and lower limits on the number of units held was abolished. This has enabled "a trade" in quota holding to emerge and their positioning as a passive investment, rather than a basis in which to actively engage in the industry. The practical impact is that divers are not necessarily quota holders and quota holders are not required to dive – quotas become an investment option, an asset to hold and to manage returns.

In 1995, the annual abalone license model was replaced by a Deed of Agreement, granting the right for a quota holder to take abalone from Tasmanian Waters, a model that set a fee structure based on an escalating proportion of abalone beach price per kilo. In 2000, the ownership of more than one dive license and to allow others to dive those licenses as supervisors became permissible, extending in 2005 to allow divers to catch abalone for others when they individually had no agreement to catch for a quota holder.

Each beached abalone has to support multiple stakeholders needs for returns, for divers it must be a viable operation and for quota holders it should provide a return comparative to other options. The current state of the industry does not provide either of these outcomes. Anecdotally, divers cannot easily recruit deckhands because of the poor return and a large proportion of divers combine this role with other jobs.

The numbers of people investing in the industry increased with the transformation of a "quota", the instrument that provides the perpetual right to the harvest of a defined share of the total allowable catch determined for a period in time, into a tradeable form. The transformation of the quota had two effects:

1. It broke the harvest element of the value chain into much smaller capital value units than when the right to harvest was attached to the catch license;

2. The break in the nexus between quota and catch license, transforms the quota into a similar form to a public company share certificate generating a potential focus on it delivering a return comparative to other investment options.

The transition from 125 licensed divers to around 450 quota owners and 120 divers, increases the range of stakeholders, motivations for and forms of engagement; each expecting a return on investment and effort, in the case of a diver a result derived from travel and in-water productivity.

The evolution from a fishery to an industry has resulted in a significant range of agents that are reflective and an extension of the foundations principles of the fishery:

- Valuable, economically sustainable export based production;
- Learning and research based policy and management; and
- Sustainability bio-mass and stock replenishment.

The agency, institutional and association stakeholder mix now includes both Tasmanian and Federal Government fishery, trade, policing and environmental agencies, the Tasmanian Abalone Council (TACL)and its quota holder sub-council, the Fisheries Research and Development Corporation (FRDC), ,specific function organisation as such as the Seafood Trade Advisory Group (STAG) and research entities such as the Institute of Marine and Antarctic Studies (IMAS)and Commonwealth Scientific and Industrial Research Organisation (CSIRO).

A key collaborative and discussion mechanism is the Fisheries Research and Advisory Group (FRAG) an industry body, funded and administered by the TACL comprising of the TACL Board members, IMAS researchers, CSIRO, DPIPWE, observers and an independent chair that was formed to allow in-depth discussion on the status of the resource, including the fisheries assessment, target catches, boundaries and size limits. The FRAG provides advice to the Tasmanian Abalone Council Board and the Abalone Fishery Advisory Committee (AbFAC); two of the three sources that the Minister for Fisheries to decide on the TACC settings, size limits and related issues, the third being DPIPWE the Tasmanian Government's responsible agency.

The Abalone Fishery Advisory Committee (AbFAC) is part of the co-management framework for the management of the abalone fishery and provides a conduit between industry, the Department, researchers, Tasmania Police, community representatives and so on. This provides a forum for stakeholders in the fishery to raise matters of interest. (Anon., 2018) The policy and fishery management role of the (AbFAC) is to provide the Minister with recommendations on all significant issues related to the commercial abalone fishery. Legislation states that the Minister must consult with the relevant advisory committee prior to deciding on key arrangements such as size limits, seasonal closures, gear restrictions and total allowable catch.

The diversity of interests and perspectives across and within these structures is significant, the impact of this is demonstrated by an excerpt from the FRAG minutes – "It was noted that the

FRAG had always been transparent, but of late input from some observers had meant that it was getting more difficult to reach an agreed position". (Tasmanian Abalone Council Ltd, 2014)

Within this maturity phase, the context, positioning and consideration of the industry is increasing in diversity and complexity, with it an increasing range of perspectives, number of direct and agent participants, in the context of a diminishing harvest and a price taking global market, exogenous factors such disease, increases in water temperature and loss of reef habitat. This results in signals of change or pressure are derived from many sources and filtered through many interests; Balancing competing interests to achieve decisions and policy and practice that contribute to multi-faceted sustainability becomes increasingly challenging. This is a significant evolution from the initiation phase where the primary stakeholders group was limited to divers, processors and a sea fisheries management entity that integrated policy, research and policing.

The above industry meta-framework is designed as a means of representing the dimensions and perspectives explicit to and inherent in the industry and importantly:

- to be reflective of the dominant values that shape the industry – as captured in the impact and outcome dimensions;
- bring to the fore the collaboration and tension between people, interests and policy that shape both the selection of the policy and strategy intervention mix and focus within them; and
- to assist in developing understanding of the cause/effect relationships within the meta-framework and its response to exogenous change and the moderating/driving impact of these mechanisms and priorities.

These structures broaden the perspectives and inputs into all elements of the industry system, as represented in the meta-framework, creating signals and opportunities for change, synergy and also for increasing tension within and between players whose connection is primarily limited to specific elements or sub-systems.

COMMUNITY

Place, people and policy generates a consideration of people as members of the industry, those affected by it and those remote to it, geographically, economically or socially, but still with an interest from a values and cultural sense.

Legislation and associated mechanisms are the primary mechanism where the balance of values, needs and expectations between these interests and priorities is sought to be achieves.

The *Living Marine Resources Management Act 1995 (Tas)* (LMR). was enacted within the policy context created by Schedule 1 of the Tasmanian government's *Resource Management and Planning System* (RMPS). The RMPS sets out a set of objectives for the sustainable management of the defined resources and a framework for developing and implementing management plans for each of the fisheries. The LMR is complemented by a range of instruments:

- Fisheries (Abalone) Rules 2000 as a management plan;
- The Tasmanian Abalone Fishery Revised Policy Paper, DPIWE 2000a as a fishery policy document and subsequent revisions.

The objectives of the management plan placed the abalone in the context created by the Act and the overarching RMPS. The management plan defined a clear set of objectives, associated purpose and measures and strategies included in Table 5.1, below.

The combination of this legislative and policy stance and actions, in combination with the commercial business and investment model results in a phase two meta-framework that represents the system within this maturity phase,

This adaptation and variation are summarised in the following discussion.

The characteristics of the market/product mix and its influences and interventions is a key starting point in the context of an industry development positioning and the bi-directional nature of cause and effect between it and the "people, industry stakeholder and culture" discussion.

Table 5.1. Abalone Resource management Plan Objectives and Strategies

OBJECTIVE	STRATEGIES
MAINTAIN BIOMASS AND RECRUITMENT To maintain fish stocks at sustainable levels by constraining the catch and size of individual abalone taken by the commercial and non-commercial sectors. In particular, to ensure that: • Abalone are harvested at sustainable levels. • Biomass and egg production do not decrease below the chosen proportion of pre-fishing egg production and that reasonable levels of egg production are maintained in all regions of the fishery. To allow abalone to grow to a size where they have two breeding seasons through the use of appropriate size limits.	1. Limit the catch of the commercial sector and restrict catching potential of the non-commercial sector. 2. To prohibit the taking of abalone at a size below which the fish have not had adequate opportunity to reproduce through the enforcement of minimum legal sizes, whilst ensuring that the minimum size limits reflect differences in both growth rates and harvesting rates around Tasmania.
SUSTAINING YIELD AND ECONOMIC RETURN To take abalone at a size likely to result in the best use of the yield from the fishery. To protect abalone below the minimum legal size. To maintain economic returns by restricting the level of catch and the number of participants in the commercial fishery.	1. To prohibit the taking of abalone below minimum legal size limits. 2. Restricting the number of divers in the fishery and limiting their catches within the Total Allowable Catch.
COMMERCIAL FISHING INTERACTIONS To separate the activities of abalone divers from those of other commercial fisheries, particularly the commercial diving and rock lobster fisheries, To limit the harvesting of seaweeds until there is a better understanding of the ecological implications of such harvest.	1. Prohibit access to abalone by holders of fishing licence (commercial dive). 2. Prohibit access to other species, such as rock lobster and sea urchins, by holders of fishing licence (abalone dive). 3. Limit entry to the harvesting of marine plants.

ACCESS TO FISH STOCKS BY NON- COMMERIAL FISHERS To provide reasonable access to abalone	1. Limit the catch of the commercial sector 2. Maintain individual daily catch limits for recreational

stocks for recreational fishers and Aboriginal people. Restrict daily caches of rec. fishers such that it is not a cover for illegal fishing.	divers and Aboriginal people. 3. Maintain possession limits for all person.
MARINE FARMING INTERACTIONS To enable both the farming of abalone and the harvesting of wild stocks to co-exist without posing a threat to the other.	1. Maintain a record of the movement of abalone onto and off marine farms to reduce the possibility of such operations illegally passing wild abalone through their farms. 2. Encourage marine farmers to have visually distinct abalone so that they are distinguishable from wild abalone, thereby preventing the transfer of wild abalone onto a marine farm. 3. Conduct research into parasites and disease of abalone on farms and in the wild, to reduce the introduction and spread of diseases.
ENVIRONMENTAL INTERACTIONS To maintain the marine ecosystems upon which Tasmania's abalone stocks depend and minimise the impact of other fisheries on the ecosystems. To maintain a robust abalone stock around Tasmania.	1. To control the harvesting of native seaweeds. 2. To reduce the impact of introduced seaweeds. 3. Set the TAC for the commercial fishery at a conservative level, thereby minimising the impact of population declines on the ecosystems. 4. Establish a series of Marine Resources Protected Areas so that representative Tasmanian ecosystems are reserved under a no-take policy. 5. Set minimum legal size limits to reduce the potential for local depletion and disruption of community structure.
ENFORCEMENT To prevent the combined take of abalone by licensed commercial and recreational divers, Aboriginal people and unauthorised persons from exceeding the sustainable productivity of the Tasmanian abalone stocks. To prevent recreational divers, Aboriginal people and unauthorised persons from selling abalone. To prevent unauthorised persons from taking or possessing abalone. To prevent any person from possessing commercial quantities of abalone without suitable documentation.	1. Prohibit licensed commercial and recreational divers, and Aboriginal people undertaking Aboriginal cultural fishing, from taking more abalone than they are authorised to harvest. 2. Prohibit recreational divers and Aboriginal people undertaking cultural fishing from selling abalone. 3. Prohibit unauthorised persons from taking, possessing and selling abalone. 4. Prohibit any person from possessing commercial quantities of abalone without suitable documentation. 5. Require that documentation is maintained for all abalone moving through the processing system.
COST RECOVERY AND RETURN TO THE COMMUNITY To recover the Government's operating costs for the abalone fishery (commercial and recreational) from the participants through fees agreed in the Abalone Deed of Agreement, and licence fees from holders of abalone quota, commercial abalone divers and recreational licences. To recover a portion of the resource rent	1. Set licence fees for holders of abalone quota, and commercial and recreational abalone divers at such a level that operating costs are met. 2. Set fees in accordance with the schedule under the Abalone Deed of Agreement and set licence fees for holders of fishing licence (abalone quota) in accordance with the level of fees under the Abalone deed of Agreement.

generated by the commercial fishery through fees agreed in the Abalone Deed of Agreement and licence fees from holders of abalone quota licences.	
QUALITY ASSURANCE To maintain the high level of quality assurance for abalone To promote best practice in the handling and processing of marine resources for human consumption.	1. To maintain carrying, handling and storage practices for fish at a high level aboard fishing vessel and by processors. 2. Require all fish processors to operate to the export standard set by the Australian Quarantine Inspection Service.

Market/Product

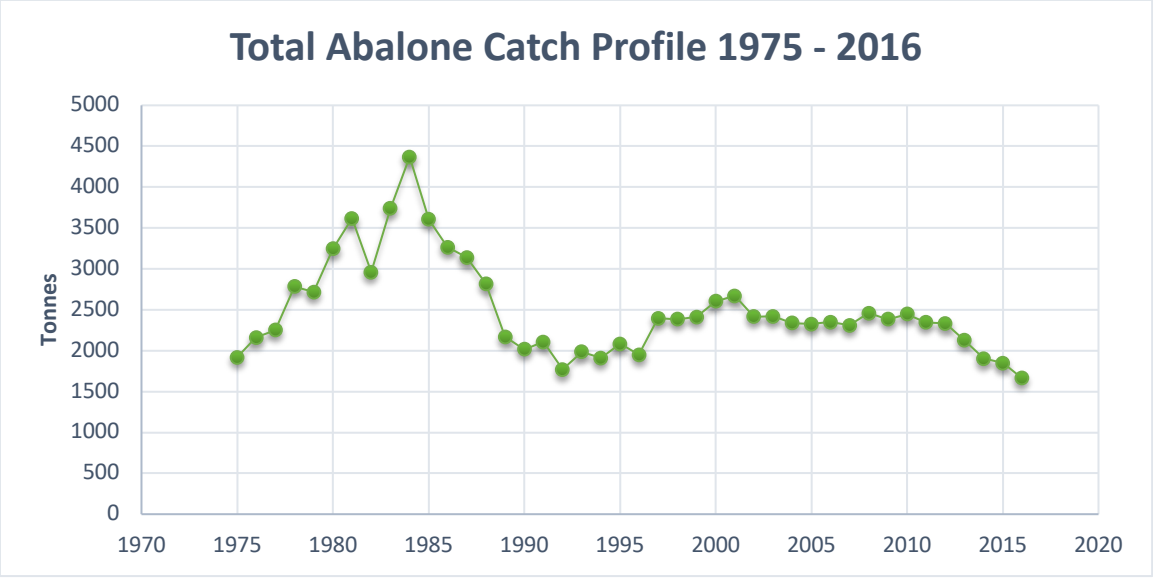
The Tasmanian abalone industry continues to provide 18% of the global wild-catch industry and is the States most valuable wild fishery (ABARES, 2018). This is despite a downward trajectory in allowable catch limits and in beach prices in real terms.

There are parallels between the abalone and rock lobster industries and their sustainability characteristics, in particular their wild-caught nature, stock management and markets. This commonality led to the formation in 2014 of the Seafood Trade Advisory Group (STAG), comprising Australian Exporters and representatives of the Australian wild abalone, rock lobster and premium seafood industries. The role is as the abalone and rock lobster representatives of the Australian seafood sector. The formation indicates the active participation of the industry in government to business and intergovernmental relations at the state, federal and international levels as a means of ensuring a sustainable business model for the industry.

Production and Price

The industry is highly dependent on the Western and Eastern fisheries, these accounting for around 75% of the Tasmanian catch and over 80% of the value. These fisheries provide the flow of abalone to the market in both volume and higher value "live" product, however these zones are also identified as dynamic in nature and declining in abundance/stock. Figure 2 following, profiles the Total Tasmanian Abalone catch from 2000 to 2016.

Figure 5.4. Total Abalone Catch Profile– 1970 - 2016 (Mundy & Jones, 2017)



The profile (Mundy & Jones, 2017) demonstrates the transition to a mature, managed fishery from the early 1990's following the establishment phase and a period of learning in how to move to a sustained level of harvest. The decline in TAC and harvest from 2010 provides a signal that questions the sustainable catch level using the current industry model.

This provides a backdrop to the consideration of the market.

Market

In 2015, Tasmania produced 18.3% of the global wild catch abalone trade (ABARES, 2018) (Mundy & Jones, 2017).

The change in supply has not impacted the beach price, that achieved by divers on presentation to the processor. TAC identified that the 2016 beach price of A$50.77 per Kg is relatively close in nominal terms to the A$47.22 received in 2001 and is some A20.00 less than its real value equivalent in 2016 values; this price continues to decline dropping to around A$38 in July 2018. (Lisson, 2108) The estimated value of abalone exports to Australia was A$187m in 2016-17, this is less than the approximately A$197m achieved in 2011-12. ABARES identifies that

> "*Despite the reduction in global wild-caught production, global prices of abalone have gradually fallen, reflecting increased global supply of aquaculture-produced abalone A forecast increase in the value of aquaculture-produced abalone will be offset by a forecast decline in the value of wild-caught abalone. Australian aquaculture abalone production has risen significantly over recent years (increasing by 62 per cent to 757 tonnes between 2006–07 and 2015–16) and is expected to continue to expand over the medium term. In contrast, wild-caught production declined by 32 per cent between 2006–07 and 2015–16. Over the medium term, wild-caught volumes are expected to remain constrained by the assumption of conservatively set total allowable catch. By 2022–23 the value of Australian abalone production is forecast to increase to $174 million (in 2017–18 dollars), reflecting growth in aquaculture production.*" (ABARES, 2018, p. 2)

The Tasmanian abalone industry operates in a highly competitive market and is subject to both direct competitors and substitutes. China is the largest market for Tasmania's wild catch abalone, followed by Japan; while primarily for live abalone, processed abalone forms an important market competitor. (Lisson, 2108) Competition is based on both abalone aquaculture and "ranched abalone" from South Africa and Chile based on sea based operations seeded from aquaculture operations.

The Tasmanian Abalone Council Ltd meetings exhibit a strong focus on market conditions and exogenous factors that will "shock" the wild catch abalone industry model, including, exchange rates, trade agreement and conditions and international relationships. The Seafood Tasmania Advisory Group (STAG) takes a specific focus on this element of the industry.

The industry, despite the argued positioning of the product within the market, remains a "price taker"; the real unit value is forecast to remain flat as a consequence of increased farm based production (ABARES, 2018). Tasmanian wild-caught abalone have retained their beach price premium over the average Australian beach price but has also failed to achieve real price levels (Lisson, 2108).

The "industry maturity" is reflection of a professional and future oriented approach to the influence of and the industry's stagnant or relatively declining positioning the global abalone market.

The characteristics of the market are key determinants of the strategic, operational and policy context within the industry. The introduction and expansion of the live abalone market in the 1990s and the relatively higher beach price for abalone meeting the criteria increased fishing pressure for live blacklip abalone in the South of the State. The demand for live abalone led to the formation of catch zones to better manage the resource by allocating TACC to zones, support variation in minimum size length between zones and mitigate over-exploitation of specific localised areas of high yield of abalone meeting the market criteria, Each quota holder was allocated a proportional share of the TACC within the zones (Mayfield, et al., 2012). This interdependency between market/product characteristic highlights the necessity of "whole of system" analysis and management and in particular the conjoint nature of elements within the system that also vary based on the contextual parameters; in particular, factors impacting productivity.

Productivity

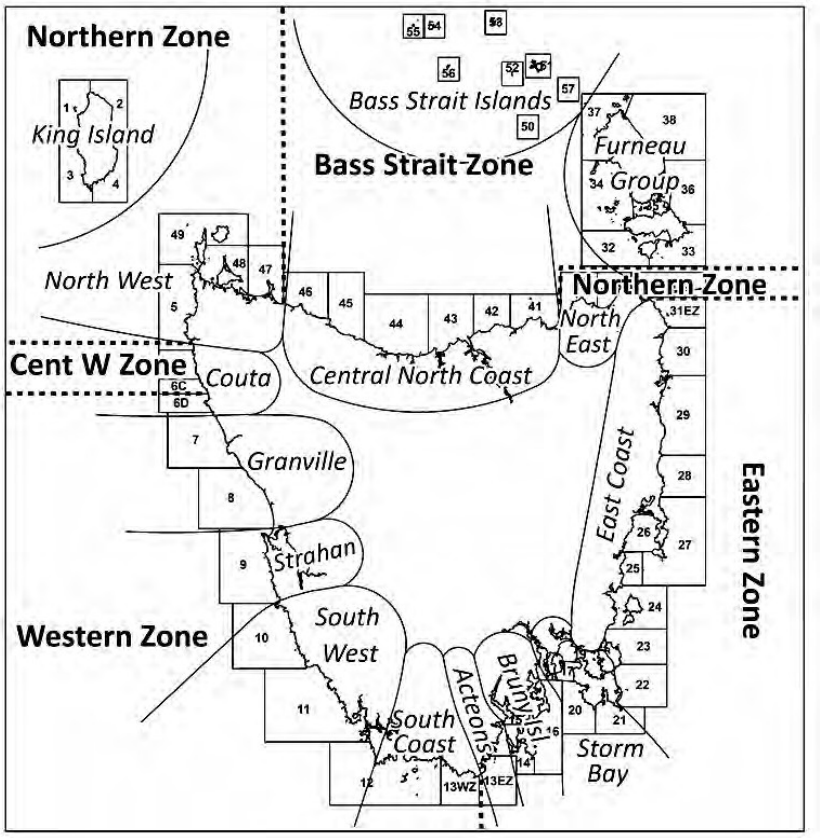
Within an environment characterised by reducing production volumes and downward trending prices, increased productivity across all elements of the value chain is a key strategy to success.

Three interrelated perspectives define the potential productivity of the industry:

- the replenishment of abalone stocks within catch zones as a consequence of catch, eco-system and environmental conditions and other exogenous factors such as disease; and
- the productivity of the harvest process and
- the quality of the product delivered to the processor.

These perspectives had been identified in the initiation and establishment phase of the industry (Harrison, 1985) and while attempts had emerged, effort and data collection was discontinuous (Harrison, 1985) (Mundy & Jones, 2017). The emergence of the "catch per unit effort" (CPUE) and the introduction of data loggers that capture time, location, travel and depth that are then complemented by catch weight, provides the basis for detailed statistical analysis by the key area of management – "zone and block". The Tasmanian Coastline has been geographically classified into these categories as represented in the following map.

Figure 5.5. Tasmanian Abalone Management Zones



The value of this research is demonstrated in a range of the observations included in *The Tasmanian abalone fishery assessment report 2016,* including:

- *Catch and catch rates in the Eastern Zone have oscillated substantially since 1992, with evidence of a cyclic pattern of depletion and recovery (fig. 3.1). No other Tasmanian Zone shows this pattern.*
- *In 2016 the zone wide catch weighted mean $SCPUE_{CW}$ was 52 Kg/Hr and only marginally higher than in 2002 (mean $SCPUE_{CW}$ 50 Kg/Hr), the lowest year in this time series (1992 –2016). (fig. 3.1).*
- *In particular blocks 16 and 27 have declined by around 75% since the early 2000's, whereas the TACC has only declined by approximately 50%. North of Tasman Island however the trends are either stable or declining.*
- *Of concern are blocks 22, 23, and 29. Catch rates in block 22 are stable although catch is declining rapidly, while catch and catch rates are declining in block 23 and 29. All three of these areas have yielded higher catches over the past few years, and do not appear to have the resilience to sustain this level of fishing pressure, even for short durations.*
- *The effects of the 2015/2016 Marine Heat Wave on abalone populations varied across the Eastern Zone but were most apparent on the Tasman Peninsular and Bruny Island. Several of the blocks that were showing strong signs of recovery in 2015 (blocks 16, 17, and 21) declined dramatically through 2016.*
- *Catch rates in Blocks 16, 17, 20 and 23 started the fishing year at or marginally below 2015, then declined rapidly each quarter. Blocks 21 and 22 started the fishing year at a markedly lower catch rate than observed late in 2015 and remained low through the year.*

- *The zone-wide proxy for biomass is 2.0 and above the LRP of 1 (section 2.4.6) and the zone-wide proxy for fishing mortality is -0.5 and below the TRP for sustainability (fig. 3.3).*
- *Trends evident in the spatial indicators show strong coherence with trends in CPUE. For most reporting blocks trends in Kg/Hr are correlated with trends in CPUE, and trends in the swim rate (Metres/Hr) are inverse to CPUE.*
- *As CPUE improves we expect that productivity per hectare will also improve, and that the swim rate will decrease as divers spend more time harvesting and less time searching. Sharp declines in CPUE associated with the MHW are mirrored by decreases in Kg/ha and increases in the rate at which reef is being covered by divers (Metres/Hr).* (Mundy & Jones, 2017, p. 14)

This excerpt is indicative of the focus on within the research into and identification of the interrelationships the connections abalone stocks and flows, catch productivity and allowable catch.

In an attempt to understand the productivity of the industry, as described above 50 years of research has been invested. The biological research has led to improved understanding of spatial and temporal variation in abalone growth, mortality, size-at-reproductive maturity, morphology and recruitment – in essence fishery productivity characteristics that inform decisions around the natural capital stock and flow based on TACC and MSL. From 2002, research was expanded (Mayfield, et al., 2012) to develop understanding of connectivity and gene flow; determining abalone age; adult translocation for stock re-building and urchin barrens occurring as a consequence of the southward expansion of warm water currents (Mayfield, et al., 2012); this evolution demonstrates extension of research from endogenous factors within the system to exogenous factors; These occur within the research framework of annual fishery assessments that have occurred since 1997. In parallel with this is, other disease, value chain and trade based research into exogenous influences on the system.

The translation of this into policy, strategy and management decisions is a function of how the signals from the findings are processed by the stakeholder groups and players identified above. Despite the Act and associated plans objectives of achieving maximum sustainable yield (MSY), the absence of guidance, decision rules and supporting frameworks to estimate MSY and measure its achievement do not exist (Mayfield, et al., 2012). Within this context, the productive use of knowledge to innovate exacerbates the potential tensions that characterise the widening group of stakeholders associated with this maturity phase.

The default policy position with regard to biomass management has been to reduce aggregate quota, or in specific blocks to reduce TAC and/or increase MSL with the expectation that natural processes will result in fishery recovery. This recruitment result would require a significant juvenile population to be in place.

Effective management of the fishery requires detailed understanding of these dynamics if the fishery is to be sustained under its current "managed harvest of naturally occurring stocks" approach. The challenge in this is shown in the following summary of bed characteristics for 2013, Table 5.2, following which represent current condition as the basis for intervention design.

The blocks highlighted in "red" are demonstrating both falling catch and catch per unit effort, conversely the "green" are exhibiting rises across these measures. The critical dimension is the inclusion of the Western Zone Blocks – the zone on which the industry is highly dependent.

Table 5.2. Summary of changes in catch, catch rate (CPUE) and median length, by region, and interpretation for fishery status – (Tarbath, 2013).

Catch	CPUE	Length	Interpretation	Region
stable	rising	no data or erratic	Stable or increasing abundance	Central North Coast (BSZ)
stable	falling	no data or erratic	Falling abundance	Block 9 (WZ)
stable	stable	no data or erratic	Abundance stable or falling	Bruny Island (EZ), North East (NZ)
stable	erratic	rising	Depends on relative strength of CPUE, but in absence of rising CPUE, abundance probably falling	Block 22 (EZ)
stable	erratic	no data or erratic	Depends on relative strength of CPUE, but in absence of rising CPUE, abundance probably falling	North West (G)
falling	falling	rising	Stock levels almost certainly falling, absence of recruits causes median length to rise, indicates weak recruitment	South Coast (WZ)
falling	falling	falling	Stock levels almost certainly falling, high fishing mortality reduces median size	Block 6 (CWZ), Block 5 (NZ)
falling	falling	no data or erratic	Stock levels almost certainly falling	Block 31 (EZ), Strahan North (WZ), King Island (G)
falling	stable	rising	Stock levels almost certainly falling, absence of recruits causes median length to rise, indicates weak recruitment	Actaeons (EZ) Lower Channel (EZ)
falling	erratic	no data or erratic	Stock levels stable or decreasing, less likely to be increasing.	Furneaux Group (BSZ)
rising	rising	no data or erratic	Increasing abundance	Rem'dr North East (EZ)
rising	falling	rising	Stock levels falling, reduced recruit levels	South West (WZ)
rising	falling	no data or erratic	Stock levels falling	Rem'dr North West (NZ)
rising	stable	no data or erratic	Stock levels stable or increasing, less likely to be decreasing	Furneaux Group (G)

Sustainable Wild-catch Ecosystem

Within the context established by the goal of "Sustainable Development of Tasmania's wild catch Abalone Industry, the multi-perspective productivity discussion brings into focus the underpinning necessity for a wild-catch ecosystem within that economic context.

The maturity phase has highlighted the vulnerability of the industry to eco-system factors:

- Water temperature and storms;
- Disease; and
- Species invasion.

Water Temperature

Abalone are vulnerable to storm and warm water events. Harrison (Harrison, 1985) identified the impact of a warm water event on West Coast abalone mortality in 1971, these events continue to occur including. In 2010, a warm water event on Tasmania's East Coast killed large numbers of abalone. The Institute of Marine and Antarctic Studies (IMAS) identified that the effects of the 2015/2016 Marine Heat Wave on abalone populations varied across the Eastern Zone but were most apparent on the Tasman Peninsular and Bruny Island (Mundy & Jones, 2017).

Trend increases in water temperature and forecast increases in severe events, affecting specific zones differently potentially adds to uncertainty in maintain an abalone catch that is economically sustainable in all zones.

Bio-Risk

The industry's major bio-security challenge arose when a previously unknown abalone disease was detected in western Victorian abalone farms. This emerged in early December 2005, soon after significant translocation of brood stock to farms occurred as part of the "National Abalone Breeding Program". The translocation included Tasmanian Blacklip Abalone.

All participating farms were infected apart from a single operation that held animals in a bio-secure facility. The disease amplified in the farms for some 6 months post identification of a fish health problem, during which time much of the stock perished and the water was continuously flushed into the sea, infecting the first wild Blacklip stocks in May 2006 with devastating consequences.

Much was been learned from this major event. The disease is now known as Abalone Viral Ganglioneuritis (AVG), it is found to be endemic in Tasmanian Blacklip Abalone and appears to manifest in some abalone when the animal is severely stressed.

As a precautionary measure, the Tasmanian wild fishery closest to Victoria was closed in August 2006, fully re-opening in January 2008. Fears of the condition also saw the Lower

D'Entrecasteaux Channel closed between September 2008 and March 2009. Sampling in the areas failed to find diseased abalone.

Subsequently AVG was identified in 2008 and 2009 when sampling Tasmanian live holding processing facilities. In December 2010 there was a further outbreak of AVG disease in greenlip abalone farmed at Bicheno. While the disease was initially detected in an abalone processing facility and subsequently spread through untreated discharge to the marine environment, but no evidence of AVG was found in the local wild population. The outbreak at the farm resulted in the compulsory destruction of animals and decontamination of all of the affected facilities (Jones, 2011).

The conclusion was that AVG is endemic in Tasmanian abalone and that the Victorian farm possibly introduced AVG by importing Tasmanian brood stock. The disease risk has been extensively researched and mitigation strategies and processes introduced to minimise risk. Observation indicates that greenlip abalone appear to be more susceptible to AVG or, at least, have a lower resistance to the disease.

The relationship between stress level and AVG is not clear. While there have been large numbers of abalone deaths as a consequence of naturally occurring warm water and storm events, there is no evidence of wild abalone demonstrating AVG disease as a result of natural events.

The precautionary principle has rightly resulted in the adoption of best practice to mitigate AVG risk.

Risk to the genetic characteristics of local wild abalone populations is not identified as a biological risk. IMAS research indicates that larval dispersal is highly localised. The use of breed stock from the area to be reseeded further reduces any potential risk.

While larvae are not widely dispersed, the dispersal remains significant enough to prevent either speciation or the development of sub species or geographic races amongst blacklip abalone

Invasive Species

Another dimension to biological risk, is the maintenance of the eco-system within which abalone and other endemic species survive. The potential for the depletion of abalone stock to possibly allow, invasive species infestations, such as urchin populations to colonise, expand and the consequent reduction in, for example, kelp beds - diminishing the natural ecological characteristics of the coastal environment with potentially unknown adverse consequences.

The infestation which has attracted most attention is that of Centrostephanis rodgersii, a sea urchin that established itself along the Eastern Tasmanian coastline.

> *The introduction of urchins to intact algal beds causes abalone to flee and seek shelter in cryptic microhabitat which will negatively impact both their accessibility to such microhabitats, and productivity of the abalone fishery, and will potentially affect their growth and survival, while the presence of the abalone has no detectable effect on the urchin* (Strain, et al., 2013, p. 1)

This conclusion is consistent with the management plan introduced through a TACL subsidy to harvest the sea urchin. The program is funded by an agreed reinvestment of the royalty payable on abalone harvest to the Tasmanian Government into an "Abalone Industry Re-investment Fund" (AIRF) which aims to:

- Remove the urchin from productive abalone areas to a depth of 20m where incipient barrens may transition to extensive barrens if not "cleared";
- Where possible collaborate with the urchin fishery to ensure the ecological balance between the abalone and urchin populations on the East Coast (sic) (Lisson, 2108)

In 2017/18, 172,000 tonnes of urchins were removed.

Abalone Recruitment and Stock Enhancement

The AIRF program proposes investment into evaluating options improving the recruitment of abalone to enhance the stock level; in particular within the East Coast Zones most affected by the urchin invasion.

The three options include:

1. Translocation of mature abalone;
2. Re-seeding using hatchery reared juveniles; and
3. Re-seeding using hatchery or locally produced larvae.

This occurs within a global context where stock enhancement has met with varying success and where TACL policy opposes permitting genetic material from abalone farms into Tasmanian waters (Lisson, 2108).

The potential surrounding a mixed strategy of:

- Reducing threats to natural recruitment;
- Re-seeding; and
- Reducing catch is a new domain for the industry and a move towards a level of innovation outside their traditional scope of initiatives.

The mix is an option not available to most fisheries, and has some support

> *Abalone stock enhancement remains one of the few viable alternatives for increasing the profitability and biomass of a fishery without compromising the current fishery in terms of access or allowable catches (Hart, Farbris & Daume, 2007). Economically viable stock enhancement could provide the fishery with stock numbers towards virgin levels, thus increasing catch rates and ultimately economic efficiency and profitability* (Stevens, 2012, p. 6).

Conclusions

The mature phase within the wild catch abalone industry's development has increased the range of invested and interested participants in the industry; this increased the complexity of the industry, relative to its initiation and establishment phase and has occurred in a period when total allowable catch limits (TAC) is declining and real price is declining in the face of increase abalone aquaculture production globally.

The scope and focus of elements/activities that comprise the industry, surrounding its "value chain" have been determined by the "sustainable industry development" and its – "maximising sustainable yield" goals articulated in the legislative and policy framework and the return on investment culture derived from the external investment in the industry enabled by the introduction of Individual transferable quotas that have created a market for the perpetual rights to harvest a quota share of the total allowable catch determined for each year as the basis for the return on investment.

The meta-framework provides a means of means of consolidating in a single representation, the connections that influence the way the industry works and adapts to new and emerging pressures from both within the system and those from markets, exchange rates and government decisions. An example is the impacts of increased water temperature, climatic events and their propagation through the system as it currently works in conjunction with the replenishment capability of the abalone stock and the potential for seeding specific beds is an example, of where the technical options are tested against the culture of decision making within the industry structures.

The meta-framework enables the stark difference between phases to be highlighted. The mature phase has been characterised by declining production, declining real unit prices and higher costs and investment in management and research. Abalone is viewed in economic terms, production level and price and importantly within traditional fishery models in a world market for abalone that is markedly different to that which existed at initiation.

When does the diminishing returns from the abalone industry model and its trajectory reach a tipping point where the combination of return and opportunity cost of the investment?

Is there a next phase of the wild-catch abalone industry that demonstrates increased and benefits and more resilience that the natural economic resource model delivers?

The sustainability of multi-generational industry brings challenges of systematic adaptation to changes in market and business conditions that are reflective of cultural and behavioural change that impacts on what is delivered, how it is delivered, how it delivers and balance benefits and costs and how those benefits and costs are distributed. The next section explores these challenges in the context of place.

Phase Three Industry in Place

Tasmania's economy has traditionally been natural resource based. Primary production, mining and over the last century, manufacturing that was attracted to the State by access to reliable, relatively low priced hydro-electric power, has formed the basis of this economy. The contested nature of increasing hydro power production through the construction of new dams in locations defined as wilderness, was demonstrated by the unsuccessful protests against flooding Lake Pedder in South West Tasmania during the 1970s as a consequence of damming the Huon River. Opposition to the proposed Gordon below Franklin Dam and power generation scheme escalated from commencement of protests in 1978 through Federal Government intervention and Australian High Court rulings to halt work in 1983.

The contestability of ideas, policy and practice within the natural resource economy was further demonstrated in the "Tasmanian Forest Wars", influence that resulted in the native forest industry effectively transitioned through a mix of legislative change and market pressure from utilisation of endemic species to re-growth forest and plantation resource as its harvest base. The Tasmanian Salmon Industry is experiencing increasing public scrutiny and pressure in relation to current and proposed new locations on both environmental and amenity impact grounds, despite meeting formal approval conditions; the pressure a signal around potential re-balancing the dominance of economic contribution and science as key decision determinants.

The combination of direct formal and informal action by interests and associated agents, together with evolving determination, regulatory and approval processes have created both the opportunity to participate actively in approval processes, and the opportunity to generate informal processes that are designed to obstruct what are viewed as partially or wholly unacceptable development and existing operations. The Tasmanian Abalone Council Limited (TACL) has utilised these mechanisms to express views in relation to the expansion of the range of salmon farms and the development of wood processing facilities adjacent to abalone harvest locations (Lisson, 2108).

These examples demonstrate the potential for the economic profile and practices, and eventually the culture, within places to be fundamentally altered by increasing the diversity of perspectives represented and articulated within places through their people and connections; emerging and converging values leading to a cultural evolution that frames other priorities; in effect structural dynamics.

Examples such as those identified are based on highly visible, contested and often emotive narratives framed around views of "intrusion" on the values and pre-existing utilisation of characteristics of a place and/or "best use of resources" that range from full preservation to full exploitation. The binary nature of these contests and the agent and agency structures that are created to prosecute and refute argument and gain support and ascendancy turn the "reasonable question" into a form of warfare that demonstrates capacity to be self-perpetuating. The progression from defining the operational context as a "fishery" to a

broader context is demonstrated by the TACL in a report titled "Maintaining Healthy Abalone Reef Systems…" (Lisson, 2108), however it also demonstrates a specific industry perspective

An alternate positioning is to develop an understanding of the values at play in tangible and intangible perspectives that influence people's individual and collective perceptions in defining the essential characteristics of "place", the industry, its positioning in the market (as a reflection of place) and in its production place, two places converging through the product offering and its attributes as a means of developing a decision framework and decisions.

Research focus provides an indication of the trajectory of interest in an issue. Phases One and Two as described above, indicate a transition from abalone distribution and biological research to aspects related to reef ecosystem health. Current ACL joint research projects include a program of "Environmental Monitoring of the Lower Channel and Actaeons Reef Systems based around a diverse series of projects including Abalone recruitment, Sediment quantity and composition, reef health surveys (weed cover and type, substrate cover, sediment/dust and filamentous/green algae), water and sediment quality and abalone abundance. The ACL research and activity focused on harvest of the sea urchin Centrostepahnus rodgersii occurs under the title of "Maintaining healthy abalone reef systems on Tasmania's East Coast by:" (Lisson, 2108) an indicator of the industries deepening consideration of the condition of the reef systems and the broad factors contributing to their health.

The concept of the rocky reef system health, contribution and functionality is only emerging as a research field. This research is important and is an indicator of the evolution of thinking from a "fishery" to a "fishery in its underpinning reef ecology as an abalone habitat". More broadly focused research positions and analyses the reef ecosystem as more than the habitat for a single or evidently interrelated species, an example of this alternate perspective is demonstrated by Bennett et al (Bennett, et al., 2016) providing a focus on the diversity significance, scale and value of the 8,000 km rocky reef system that pans from sub-tropical New South Wales, southwards around Australia's southern coast, including Tasmania and northwards to Kalbarri in Western Australia. This report is explicit in focusing on social, ecological and economic perspectives of the reef system, attributing it to the generation of A$10 billion per year from commercial and recreational fishing and tourism. The diverse role of the Great Southern Reef in providing ecosystem services is a feature; these include direct outputs such as food production and indirect roles including climate control, nutrient recycling and coastal protection. The high levels of known biodiversity and potential for discovery of new species in part relating to the significant endemism provide both scientific interest and the potential for further production for food and other applications.

The paper highlights that the current contribution by the reef system to Australian coastal communities and its potential contribution is unrecognised and unknown and that while the reef system is relatively healthy and well managed by global standards there are growing pressures from climate change, population growth and coastal development. Losses of giant kelp from exposure to warm, nutrient poor water, high rates of endemism and increased grazing pressure from sea urchins whose populations have migrated southwards with the

warmer water. Local kelp forest communities have also declined as a result of nitrogen rich pollution; these local losses coalesce to manifest regional impacts (Bennett, et al., 2016). The kelp forests are identified as the biological engine of the reef system, highly productive by providing habitat and the trophic foundation to support the system; producing as much as 65tonnes of biomass per hectare per year which provides food and detritus into the coastal ecosystem. The dynamics of change vary along the reef in the manner in which global and local stressors combine to impact the reef system differently in different places.

This reef ecosystem and its tangible and intangible connections to Tasmania and its community is the place that defines the supply side future of the abalone industry, the manner in which this is approached defines its market positioning.

By virtue of its dispersed harvest and off-shore, often remote location collection, the abalone industry is non-intrusive and has "low visibility" in terms of direct and perceived indirect impact on the lives of people outside the sector. The Tasmanian Salmon industry, by contrast has increasingly been subject to community pressure in following the industry expansion plans and the extension of locational range of fish pen operations around Tasmanian waterways. The need for "social license to operate" is globally evident and recognised within the seafood and aquaculture industries and has been subject to research and fishing industry guidance reports (Ogier & Brooks, 2016). Complementing the TACL consumer engagement strategies (Lisson, 2108; Bennett, et al., 2016) with community engagement strategies would appear prudent given the challenges that have emerged for other sectors.

The Great Southern Reef and specific sub-regions within it are in a highly dynamic state, the contributions made by the reef and its eco-system are recognised in reductionist ways, for example how well it supports abalone recruitment; the loss of kelp forests, extension of the southward range of warm water species, this reductionist focus has limited consideration of the current and potential aggregate contribution of the reefs; conversely it has limited the nature of risk assessment within its management and the management of factors that influence its condition.

Researchers conclude there is a need for "a greater understanding of the functioning..." (Bennett, et al., 2016) of the reef system, a more holistic and connected system approach. The adoption of a "functioning" stance to research, understanding and management reinforces its recognition as a complex adaptive system as an overlay to both systemic, species and industry research, management and practice.

This provides the context within which the Tasmanian Abalone Industry is now considered.

The Great Southern Reef and Tasmania's Abalone Industry

The Great Southern Reef is a descriptor developed and further adopted by a number of researchers and scientists to increase awareness of Australia's temperate rocky reefs as a system that make significant ecological, social and economic benefit.

The concept of managing a major Australian natural asset while recognising local, contextual diversity has parallels with the connection between the principles, parallels and practice of

linking national macro policy and place or on-ground practice and role of specific industry sectors within this. In relation to the Great Southern Reef the link between the macro definition and place and practice occurs through linkages to and contrasts between different locations using spatially flexible approaches to provide the most ecologically sensible and cost-effective management strategies (Bennett, et al., 2016).

The principles behind this proposition have guided the design of the following meta-framework. The descriptor within the Bennett paper has been used as a proxy for a potential repositioning of the policy stance to the management of the reef system (Bennett, et al., 2016).

The principle of considering industry in place, impacts the abalone sector meta-framework representation significantly. In this context the sector is considered in the context of place, rather than as an end in itself and as consequence the outcomes sought adopt a balance of industry and community outcomes.

In the Phase Three meta-framework below, the "IMPACT" dimension places the abalone industry viability as being determined by the functionality and sustainability of the reef ecosystem (in conjunction with the management regime). Research indicates that the reef system is at risk of not fully functioning as it did; in specific locations giant kelp no longer provides the habitat and detritus that have supported species to previous volumes (Bennett, et al., 2016); this is in part a consequence of invasion of sea urchins facilitated by increase in water temperature, increase in sea urchin populations negatively impact the health and survival of abalone (Strain, et al., 2013). The concept of reef functionality, that in tandem with what it "delivers" promotes consideration of fit, interdependence, productivity and system, creating a context for learning and understanding that can better resonate with communities.

This captured in the definition of the outcomes that are pre-conditions to and an un-bundling of the impact statement into pre-requisite, interdependent perspectives that can be identified, managed and measured within the triple bottom line construct.

The ecological outcome redefines as "Sustainably functional reef ecosystem", providing a primary focus on the interconnected aspects of physical and biological functionality as a pre-cursor to abalone stocks and recruitment to ensure industry sustainability.

The "Viable reef ecoservice and product mix" reflects the role of the reef system in delivering tangible and intangible benefits, whether recognised or not, to adjacent communities and through enterprise to markets.

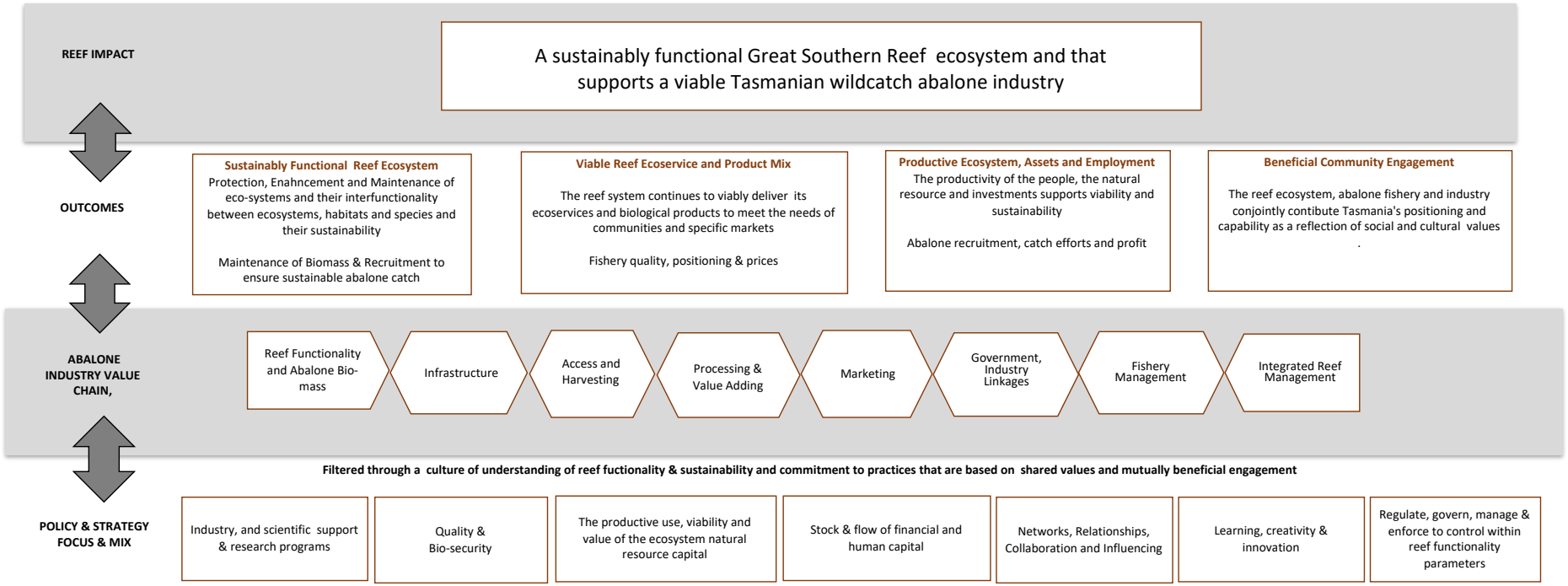
As with the Phase Two discussion, the concept of productivity has multiple perspectives and defined as "Productive Ecosystems, Assets and Employment". This positioning includes natural assets, inherent in the reef system.

"Beneficial Community Engagement" is bi-directional, gaining benefit from utilisation of the reef system and its environmental impact and engaging to the benefit of the reef system. This provides the basis of the cultural underpinning of this Phase Three approach.

The IMPACT and OUTCOMES provide the strategic intent, their achievement is dependent upon the operational aspects captured in the value chain and the policy and strategy mix are

technical constructs that are applied in a culture of mutually beneficial engagement with the reef ecosystem based on understanding.

Figure 5.6. Phase Three, Fit to Place



The meta-framework is designed to provide a basis for representing, analysing and managing specific locations, fisheries and other natural resources within the Great Southern Reef context. This is facilitated by the replacement of the "abalone value chain" with an alternate value chain that reflects the specific focus. How the policy mix is then applied is a function of current and desired condition of the elements within the meta-framework, the perceived importance of the gaps based on the underpinning sector or place culture and the resultant valuing of the benefit/cost relationship and propensity to change.

The industry in place positioning for the abalone industry is premised on viability and sustainability of both the reef ecosystem and the abalone industry, achievement of the Pareto Optimal position of making one party better off, without making the other worse off.

Addressing challenges such as identified in this industry in place phase is complex. While the technical structure helps address this complexity, the cultural and behavioural perspectives require mature, thoughtful application, this socio-technical convergence in developing awareness, focus, motivation, policy and practice is considered below in the context of the Tasmanian Abalone Industry operating within a state jurisdiction controlled of a Great Southern Reef concept.

People, Industry Stakeholders and Culture

The strategic focus of " a sustainably functional (Great Southern) reef system that supports a viable Tasmanian wild catch abalone industry" extends the scope of stakeholder interest to include those with other tangible and intangible interests in the reef system, and balancing a broader range of values, objectives and priorities, including those of the reef ecology.

Table 5.3 below identifies the impact of the change in focus from Phase Two to Phase Three through the inclusion of indicative Phase Three objectives aligned to sustainable reef functionality; these are reflective of the outcomes included in the meta-framework representation above and derived from stakeholder input and document research.

While the table focuses on indicative responsibilities and objectives, the fundamental challenge is how to facilitate the necessary coalescence of the stakeholders in a form that is both perceived as relevant by them and is productive for them; included in this is the further *challenge to the "place-based" management and development, in this instance a reef system, the ability to transition from traditional "silo" cultures to a multi-perspective approach. Critically the two are not mutually exclusive.*

A key value of the meta-framework approach is its use in determining the element(s) that require attention, considering it in its specific terms and then re-inserting it into the system to identify potential cause/effect relationships that may require adjustment either within the element under consideration or in other elements. This "within and between" concept, used for example in econometric modelling of panel data, is a foundation level of understanding to the management of systems supports the productive complementarity utilisation of system and reductionist approaches and techniques.

Table 5.3. Stakeholder Interest

Group	Responsibility/Interest	Phase Two Industry Objectives	Phase Three Sustainably Functional Reef Objectives
Government Agency	Implementation of LMRM Act 1995 Changes to schedules (TAC, MSL) Compliance	Sustainability of Abalone Biomass Sustainability of industry Bio-security	Eco-system functionality Eco-services and products Economic activity and employment Reflection of Values and Positioning of the State
Tas Abalone Council	Common voice Fishery Management Plan	Sustainability of industry Industry positioning Influencing	Viable Access to abalone stock Mitigation of risk
Quota Holders	To access quota Revenue retains/increases value of quota	Return on Investment – short and long term	
Dive License Holders	Achieve a viable income	Productively access fish Price for effort	Reef as an eco-service to improve productivity
Processors	Adequate supply of high quality fish to enable a market position	Adequate supply Pricing provides return to risk Strong market/product position and demand	Other reef ecosystem opportunities
Tasmanian Community	Industry is responsible and respectful of its position as a natural resource industry	Maintenance of biomass and coastal ecosystem Industry reflects Tasmanian market positioning & provides employment, income and cultural opportunity	Industry does not negatively impact sustainable functionality and wider values and opportunities inherent in the reef ecosystems
Local communities	Industry contributes back to community		Local, viable enterprise, employment
Researchers	Increased knowledge, knowledge transfer to improved decision making	Species and environmental, economic risk focus	Broader, multi-perspective research, contextual bases to species, issue research

Source - Author

The transition from Phase Two to Phase Three is already occurring, for example through TACL interest in factors such as sediment on reef habitat and flow on impact to abalone stocks and health. The widening of interests and research is largely reactionary and while appropriate to the needs of the industry, also makes it open to the risks of linearity; missing other factors and/or not identifying wider risks from this factor. The use of meta-framework systems logic to reflect the complex adaptive system characteristics that the reef represents is an approach to enable greater productivity from research and the consequent decisions that arise from improved knowledge and understanding.

The "reductionist problem solving around issues that present" culture exists in the absence of an alternative construct that the concept of a sustainably functional reef system, as a major natural resource, offers. Research into sediment change would continue but be placed into

the broader context inherent in this positioning and culture of learning, recognising signals and adapting through mutually beneficial engagement between researchers, industry, other stakeholders and the reef system.

Networks and relationships

Within this chapter networks and relationships have included a description of the governance and management entities and structures that reflect the development phases. The meta-framework has provided a means of identifying their individual and collective focus on their interests within the system.

Phase 3. Extends the scope of interests and formally provides the context within which the abalone and other sectors operate within the reef system. Inherent in this is the interjurisdictional nature, where the five states have a collective interest, broadened community interest and the potential for resource utilisation in areas which are to date un-identified.

The trajectory from Phases (1) to (3) has simultaneously expanded the scope of stakeholders, factors to be considered and deepened the level of consideration within these factors. How productive governance and management occurs within the increasingly complex context becomes a key challenge; although not unique to this sector/phase scenario.

Inclusion and weighting of multiple perspectives in optimising governance and management decisions, particularly across large scales that include a number of discrete locations and a mix of common and specific interests is a ubiquitous challenge. The common dimension to this is the principle of inclusion; there are varying terms applied to such systems, in this discussion "polycentric" is the model used to describe the principles. A point of difference within this discussion is the provision of a meta-framework to assist in the application of the principles and the governance/management model. The meta-framework matches the polycentric model in its ability to be applied to the "Great Southern Reef" as a large scale system and to specific location and industries as sub-systems – exhibiting the whole system/reductionist capability of the meta-framework representation.

Polycentric systems are identified as a form of interactive governance that has features that are critical when operating in complex socio-ecological systems with multiple actors (Ostrom, 1999) (Cvitanovic, et al., 2017) that contribute to their advantage in managing complex socio-ecological systems, including those hosting common pool resources, via:

- Involvement of the broadest range of actors, including multiple levels of government, industry and civil actors;
- Interaction through a range of formal and informal mechanisms;
- Policy freedom at the local level is increased to allow specific governance actions to be developed and implemented separate from the collective; and
- The ability to improve the spatial fit between knowledge, action and socio-ecological consequences by ensuring responses are applied at the most appropriate spatial scale.

As with governance models, risks and compensating factors need to be identified and determined, challenges around legitimacy of member entities, density of relationships between member entities and power distribution.

While the meta-framework approach as proposed, will not capitalise on the potential advantages multi-dimensional, multi-perspective and multi-level, or explicitly address its challenges, it and its subsidiary representation and processes do provide a structure to represent, understand and respond to the advantages and challenges of such models.

Market/Product

In terms of the abalone industry, mutually beneficial engagement with the reef system translates into a sustainable and viable wild catch abalone industry and the capacity to improve the market/product positioning, in particular the price point for the wild catch product.

In the context of the sustainably functional reef positioning, the abalone is one of a portfolio of products that the reef enables as part of Tasmania's focusing on sustainable managing its reef system to ensure it maintains its broad functionality.

In combination, abalone, rock lobster, sea urchins, kelp and seaweed derived bio-technologies have a common, place-based home and narrative that extends beyond the current positioning that each individually take. In combination they reinforce "place", its characteristics, values and opportunity.

The broadening of context enables broadening of market/product mixes.

Sustainable Wild Catch Ecosystem

The concept of ecoservices, applied to the Great Southern Reef (Bennett, et al., 2016) introduces the concept of the rocky reef systems as a host to multiple species many yet undefined, complex interrelationships, high levels of endemism and also its role in protecting coastlines and supporting communities.

The research base on which the abalone fishery is managed has commenced broadening to include the omni directional interrelationship of change and species with abalone stocks, further to this research into reef reseeding options has commenced.

The consideration of the rocky reef as an ecoservice promotes the question of how the service is most sustainably and productively utilised, for example; is the current strategy of moving across the whole coast in conjunction with varied catch and size limits preferable to intensively harvesting areas that are naturally more productive based on ongoing reseeding, while closing or reducing catch levels of other, less productive areas. Such questions facilitate the introduction of diversity in product description and positioning and form a productivity perspective tools such as "operations research".

The second round of questioning relates to the impact of the strategy on the sustainable functioning of the affected reef ecosystems. The use of a meta-framework to stimulate

questioning and placing questioning within a logic structure that reflects the context is a motivator and potential value driver for this meta-framework approach.

The meta-framework approach does not preclude or overweigh the operational questions that have dominated the quest for a sustainable wild catch abalone industry but places them within context and potentially enhance them and sustainability of the catch.

Conclusion

This chapter has followed the trajectory of the abalone industry from initiation through to its current position and from signals drawn from research into a potential scenario as an industry in place utilizing sequential meta-frameworks to represent and characterize the transformations, providing a predictive representation of the "industry in place", with place being framed in both a Tasmanian regulatory environment and as a custodian of a proportion of the Great Southern Reef.

The application of meta-frameworks that represent the key phases adopted, provides a means of analysing and understanding both within the phases and enabling comparative analysis between the phases and a simulation of what change potentially occurs by projecting the emergence of research into a forecast meta-framework representation.

While the abalone industry provides the case study the application is applicable to place-based development including natural and man-made common pool resources.

Key themes within the abalone case study are:

- The endogenous nature of the industry;
- The importance of defining and redefining the strategic dimension of the policy arena to capture dynamics that include changing societal norms.
- The role that culture plays in industry initiation, development and continued acceptability.

The culture of places is in part a function of the capitals that a community has to work with, those capitals also underpin the ability to harness endogenous potential. This interrelationship is recognised as an underutilised potential in Australia's regional development (Productivity Commission, 2017) and forms the basis of the following Chapter.

CHAPTER SIX – THEME THREE: MACRO-POLICY AND PLACE BASED POTENTIAL

Introduction

This chapter focuses on the interdependency of place-based development and wider macro conditions and policy and within this context considers the potential for regional places to participate in the robust and growing service economies characterised by larger cities. The context of place, as expressed in Australia's regions supports the potential for a hybridised economy where the balance of traditional primary production and community services with higher value services and the associated enterprise and employment opportunity.

The Chapter addresses the challenge of enabling regional communities to access skill and enterprise development opportunities consistent with the "new economy and creative industry" opportunities that characterize large cities. The challenge is analogous to the implementation of macro policy within a regional place but focused on the translation of a global mega-trend to a regional context. Following the proposition of endogenous capitals, the case study uses the meta-framework approach to consider how new economy skills and techniques can be applied to disrupt the heritage tourism value chain in a way the provides education and training opportunity, provides a competitive visitor experience and the basis for sustainable enterprise.

The OECD Rural 3 policy frame (OECD, 2009) identifies the importance of endogenous sourced growth based on a place's particular strengths, this is recognised and complemented by the Productivity Commission in Australia through its guiding principles to regional resilience (Productivity Commission, 2017), both in terms of local strengths and also a widening of development initiatives from capital investment in built infrastructure to the inclusion of human capitals.

The macro dimension is established in the context of the global emergence of services as a key economic driver (UNCTAD, 2017) and the definition of Australia's futures skills profile if it is to successfully participate within this megatrend (Payton & Knight, 2018) (Seet, et al., 2018).

There is a divide between urban and regional participation in the service industry, in particular in advanced services that are highly knowledge and digital intensive, this relates to both tradeables and also in initiating local, place development. While regions will not mirror the diversity and scale of city locations, the development of advanced, tradeable, service knowledge, capacity and enterprise in regions that reflects their currently utilised or latent strengths provides the capacity to improve performance and productivity through the disruption of existing and establishment of modified or new value chains (Seet, et al., 2018).

Australia's regional primary industry value chains have been highly disrupted through digital technology, other regional strengths, not subject to economic pressures or recognised as

potential economic and social opportunities have remained dormant. The dispersal of the foundations to participate in the "new economy" is important to regions by:

- Enabling people to migrate to places and their specific labour and product/service markets of interest;
- Introducing new thinking, approaches and technologies to productively disrupt existing value chains in both tradeable outputs and services contributing to liveability within the place; and
- Developing new product/service combinations and value chains that are tradeable and contribute to liveability within the place.

The vehicle identified as providing a theme around which to introduce and develop within regions is "cultural heritage". The *Australian Heritage Strategy* (Australian Government, 2015) highlights the further, potential economic and social contribution of cultural heritage to Australian places and their communities, in particular in regional locations. This provides the foundation for examining the role of Australia's cultural heritage as a platform for the development and application of new knowledge, technologies and their transformation into a learning context and regional development opportunity.

The diverse and rich nature of cultural heritage present within Australia's regions and its continuous evolution provides a context to both develop and apply future focused knowledge and skills and through improved understanding of the convergence of place, people, thinking and activity and creates a rationale for people's lives and a sense of purpose, tradition, cohesion and identity. The capacity to generate economic and social benefit by better linking the tangible and intangible with cultural heritage as a catalyst is a theme to be tested, one supported by the concept of capitals and the interdependence between cultural capital and the other capitals identified in Emery's framework (Emery & Flora, 2006).

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation; this includes customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage (ICOMOS, 2002)

Tangible and Intangible Heritage is a means of differentiating between physical cultural assets such as sites, buildings and moveable collections and undetectable cultural assets such as societal stories, customs and practices transferred from generation to generation.

Both are framed through landscapes, buildings, objects, artefacts, documents; customs/practices and stories and their interactions; the tangible and intangible elements combine to determine the signals that are received, interpreted and acted upon or not from the myriad of options that are on offer.

Places evolve and adapt based on both endogenous factors such as characterised in cultural heritage, their interdependencies and interactions reflecting conditions, the mix of circumstances; they also change with exogenous influences that alter context as a result of natural, direct or induced external shock.

Context

The importance of developing and utilising the stock of community capitals as a determinant of place environmental, economic and social performance, productivity and resilience is a central theme within this thesis. The "community capitals" construct (Emery & Flora, 2006) provides a means of profiling the productive capacity, adaptability and resilience attributes of a place on the basis of its relationship to and interdependencies with other places. These capitals are defined by Emery as:

- **Natural capital:** the natural resources and amenities in a particular location "including weather geographic isolation, natural resources, amenities and natural beauty", shaping the cultural capital connected to place.
- **Cultural capital:** the way people 'know the world' and how they act within it, including language and traditions. "Cultural capital influences what voices are heard and listened to, which voices have influence in what areas, and how creativity, innovation and influence emerge and are nurtured".
- **Human capital:** "the skills and abilities of people to enhance their resources, access outside resources and bodies of knowledge to increase understanding, identify promising practices, and to access data for community-building", as well as leaders' ability to lead across community differences, to focus on assets and be inclusive and participative to proactively shape community development.
- **Social capital:** the connections among people and organizations or the social "glue" to make things, positive or negative, happen, this includes institutional and entrepreneurial social capital that drives development through both internal and external networks.
- **Political capital:** access to power, resources and power brokers and "the ability of people to find their own voice and to engage in actions that contribute to the well-being of their community".
- **Financial capital:** access to the financial resources necessary for development and "to accumulate wealth for future community development".
- **Built capital:** regional infrastructure that supports activity at the micro level.

The utilisation of this structural definition of community capitals and the associated characteristics is evident in the mix of interventions identified within the meta-framework applications provided to this point.

The community capitals profile is extensive, enabling more options and conjoint options, than the traditional regional development program investment focus on infrastructure (built capital). Investment in enhancing human capital and to some degree social capital, at the regional level has tended to be associated with "structural adjustment" programs focused on specific industry sectors that have been adversely affected by market and/or policy conditions such as tariff reductions and pressure form changing community values. The productivity

commission identifies that these structural adjustment programs have been costly, often poorly designed and in some instances inequitable in their application and utilisation (Productivity Commission, 2017). In conjunction with the Commission's findings of a general lack of evaluation of regional infrastructure development programs and limited knowledge of the effectiveness of public investment in the arena, the commission has drawn conclusions from their research (Productivity Commission, 2017) to develop a set of principles to guide regional development investment, they are:

- A locally-owned, strategic and coordinated approach;
- Building on a region's strengths and endowments; and
- Investing in the capabilities of people and regional connectivity

These principles do not preclude infrastructure investment but place it in a bundle with other, complementary investment options and an administrative positioning. These principles are consistent with in the shift from an "old paradigm of regional development" that sought to compensate lagging regions to a "new growth oriented paradigm" based on the principle that that all places have the potential for economic growth through the application of "place-based" development policy (OECD, 2009)

The reference to regional connectivity, while having a physical and digital orientation is also important from a human capital perspective. Human capital is both transportable and a vehicle for transfer of new knowledge, skills and abilities into regions to supplement the existing community capitals, traditional economy and its practices; or to meet external markets for knowledge based services. Traditionally people have migrated from regional and rural areas to large cities to participate in the services economy and its rapid evolution to, in particular in the advance/professional services.

The provision of services is the driver of the world's economic growth and transformer of economies. Services have continued to grow as a proportion of GDP in both developed and developing economies; in developed economies replacing manufacturing and in developing economies replacing primary industry output to meet both domestic and export market demand (UNCTAD, 2017). This highlights the ability of places to "jump" from an economy based on primary industry to one increasingly focused on services and in the instance where these services are underpinned by knowledge, information and its digitised distribution through efficient Information and communication technology (ICT) to transform into a tradeable market position.

While the UN paper identifies the global trend, the data conclusion parallels and reflects the difference between the economies of Australia's largest cities and the outlying regions. The importance of services in performing social functions that contribute to the liveability of regions; enhancing economic performance, productivity and innovation by disrupting, expanding and developing supply changes and providing services that are tradeable as an input into other services and products is reinforced as key growth and productivity pathways (UNCTAD, 2017).

Developing the ability and opportunity to participate in this service economy, in particular in advanced/professional services through re-location; provision of local and tradeable services through direct provision; and/or adapting and innovating technologies and abilities to the generation of new value within the place has proven a challenge in regions. While enterprises within regions have readily and extensively adopted new technologies, this is often a very specific, commercialised disruption to an existing value chain, for example "precision agriculture and autonomous mine vehicles" other regions lag in utilisation of digital technology to exploit opportunities.

The rapid evolution of digital technology, knowledge, accessibility and their convergence in application to new fields and functions has transformed ICT into an embedded disruptive capability in strongly performing and productive economies and places, as high literacy and numeracy was a pre-requisite for specific roles in the pre-digital age, accessing and developing employment and enterprise opportunities requires a "new economy" mix that combines:

- Traditional foundation knowledge and skills;
- Critical thinking and reasoning;
- Digital technology capability; and increasingly including
- Sociability perspectives

The above balance of knowledge, skills and abilities is reflective of view that technological innovation is seen as an engine for sustainable economic development and a driver of productivity growth, and which are amplified by their interaction with each other in the so-called 'Fourth Industrial Revolution' (Seet, et al., 2018). A key finding of the report relates to the consequential changes to traditional jobs and blurring of their boundaries, reinforcing the evolution, enlargement and enrichment of jobs as a complement to the creation of new jobs and employment pathways.

Participation in these "new and evolving jobs" within regional areas, or in the learning necessary to participate is challenging from both institutional/technical and cultural perspectives. The youth development focus within the Derwent Valley case study included in Chapter Four was premised on the low propensity of some cohorts of young people and their families not valuing or recognising education as a key determinant of future employment in the face of industry restructuring eliminating the source of what was a source of low-skilled but financially rewarding employment for generations.

The lack of contemporary foundational employment skills represented as core sector technical skills complemented with digital literacy, critical thinking and creativity; supported with effective communication (Seet, et al., 2018) creates a barrier to future opportunities that are based on the ability to participate in emerging labour markets and to identify local tradeable opportunities. Digital skills have become a fundamental skill but are also underutilised in work (Payton & Knight, 2018) with business reluctant to invest because of both cost and lack of employee capability, factors leading to variation in the digital intensity of business by sector and size. The report identifies the conjoint demand for digital skills and a mindset/way of

thinking aligned to being entrepreneurial, creative and willingness to experiment within an increasingly digital workplace.

Existing sectors, workplaces and associated opportunities from creativity and innovation vary in digital intensity as well in their production/service balance and necessary knowledge/skills and cultural underpinning. Digital skills and their application will complement and integrate with a broader bundle of skills identified as the future skills required across the workforce (Allen, et al., 2017) as summarised below:

Table 6.1. Future Skills Bundles

Foundational skills	Literacy and numeracy skills, including digital and financial literacy, important for most jobs in the knowledge economy.
Skills for collaborating	Supporting a culture in which the most valuable employees are those who can collaborate and share information.
Skills for learning and adapting	Changes within jobs will be ongoing and may accelerate requiring workers to constantly adapt to new processes and technologies and to take greater responsibility for their skills development.
Entrepreneurship skills	These skills are widely considered indispensable for the 21st century and are associated with identifying problems, creating solutions, taking action and being self-reliant and resourceful.
Analytical skills	The focus on STEM (scientific, technological, engineering and mathematics) skills arises from the expectation that workers will increasingly require analytical skills, in particular to use available data and derive value from it. For some, this will require being able to analyse and present data; for others, it will require the ability to interpret data analysis and apply findings.
Skills for adding value	Creating value using fewer resources. Specific skills include creativity, problem-solving, resourcefulness, reasoning, data analysis/interpretation, customer engagement, experimentation and critical thinking.
Non-automatable skills	With automation expected to continue to take on more of the routine, codifiable tasks in jobs, employees will be expected to focus more on interrelationships and the personalisation of customer service and negotiating with and persuading potential clients. Specific skills include empathy, sociability, teamwork, social cultural awareness, communication, persuasion and adaptability.
Social platform skills	Future communication tools will require employees to be literate in new media. Social technologies drive new forms of production and value creation. Specific skills include new media literacy, design mindset, cross-cultural competency, computational thinking, virtual collaboration.

Allen's categorisation provides a summary of the emerging characteristics required of people in the workforce. The specific requirements as bundles and relative intensity of capabilities will differ with sector and responsibility levels within enterprises.

Considering the strategic and operational nature of skills as an input into performance and productivity and from the development people and place perspective in relation to individual and collective futures, the challenge is to build and apply a human capital based that

enables the people and the place to sustainably participate in contemporary and emerging society and its markets by:

- Enabling people to migrate to places and their specific labour and product/service markets of interest;
- Introducing new thinking, approaches and technologies to productively disrupt existing value chains in both tradeable outputs and services contributing to liveability within the place; and
- Developing new product/service combinations and value chains that are tradeable and contribute to liveability within the place.

These scenarios reinforce the importance of developing other capital themes to complement this human capital investment and to achieve a strong return on investment. The importance and lack of traditional focus on this complementarity is recognised The Productivity Commission in its 2017 report, (Productivity Commission, 2017); some of which is arguably limited by failure to integrate investment in a mix of physical infrastructure and the human capital to productively realise the benefit of the infrastructure and its return on investment.

As identified above this Productivity Commission principle is consistent with the "new growth oriented paradigm" based on the principle that that all places have the potential for economic growth through the application of "place-based development policy" (OECD, 2009), an emphasis on endogenous growth in the sense of smart specialisation (Foray, 2015) and smart processes of evolution that build on the traditional economic strengths of a region or country. The challenge is to complement existing assets with new knowledge-based activities that enable the economy to progressively shift towards higher value-added productions to facilitate endogenously distinct growth pathways and development.

The identification of local strengths and endogenous potential has both economic and cultural perspectives:

- A strength in the context of a viable, tradeable market; and
- An internal propensity to recognise the strength and to participate in the market.

Tangible factors are visible and evident, intangible less so; the key development questions utilised in this chapter are:

1. Are there latent intangible assets within the place that can be utilised to increase the stock of community capital that can deliver social and economic benefit; and
2. Are there ways in which synergies between the use and integration of tangible and intangible heritage capitals that can multiply this value.

The supplementary question is the utility of the meta-framework in addressing these foundation questions.

Cultural Heritage – a latent capital

A place's capitals and strengths are not always evident, exploited, or exploitable for benefit in their current form.

Much of regional Australia contains places of cultural heritage significance ranging from locations that have supported people for 60,000 years, through to the colonial settlement and the growth of primary industries, places of significant events and transformation of rural places into other forms and the social and environmental disruptions and mitigations associated with this change. This provides the foundation for reviewing the role of Australia's cultural heritage as a platform for the development and application of new knowledge, technologies and their transformation into a learning context and regional development opportunity.

The Australian Heritage Strategy contains a range of themes contained within it, including:

- The aim of the Australian Heritage Strategy is to ensure that the way in which we identify, conserve and protect our heritage is the best it can be,
- National Leadership strong partnerships and engaged communities
- Australia has a rich natural and cultural heritage that underpins our sense of place and national identity and makes a positive contribution to the nation's wellbeing
- Heritage assists us in maintaining our connection to place, fosters pride in our community and is an important factor in building and maintaining community harmony. Strong communities are vibrant and forward-looking, with rich social and cultural experiences. In parallel with the social value of heritage (or cultural capital),
- Natural heritage contributes to the natural capital that supports Australia's clean land, clean air and clean water. This in turn underpins community health and wellbeing.
- In recent years studies have shown there are economic benefits associated with heritage sites. A comprehensive assessment of 15 of Australia's World Heritage areas found the economic impacts to the nation were in the order of $15.4 billion in annual turnover and just over 79,000 direct and indirect jobs. (Australian Government, 2015)

These themes both reflect the capitals available for utilization and to be enhanced as improved stocks of capital that further multiply the benefits of investment and development.

These excerpts indicate a mix of functions and the current and potential environmental, economic and social outcomes associated from the described conditions and the inherent development potential, the strategy places heritage within the capitals framework and its development logic.

The strategy, while identifying connections between the descriptors of heritage categories does is silent in relation to framework for the systemic integration of the range of heritage perspectives and factors raised within the partnering mechanisms identified.

Public investment in cultural heritage has predominantly reflected the concept of market failure premised on the notion that the "asset" fails to deliver a tangible benefit and/or the commercial viability that will attract market investment. The utilisation of cultural capital, incorporating the tangible and intangible dimensions introduces a different value chain to that traditionally associated with cultural heritage in Australia, extending and expanding value and providing an economic logic to its utilisation and target for investment.

Public Policy is a reflection of culture but also struggles with its approach to both how culture and heritage are positioned within discourse and in the policy, public investment agenda when the economic "logic" dominates distribution of capital and recurrent funds. The utilisation of the community capitals potentially creates a context where culture is enriched through economic logic (Throsby, 2010).

The concept of awareness and understanding of origins as a contribution to identity is important in individual, family, community and other constructs. This is demonstrated in the popularity of museums, natural areas, specific high profile historic and cultural locations and on an everyday level in study, publishing and production of television programs that transform culture into cultural heritage through interpretation and representation.

Within many locations there is a greater stock of intangible and tangible cultural assets available than are utilised to create value; evidenced for example, in factors including unemployment and underemployment rates and declined or underutilised buildings. There is a tendency to view expenditure on culture and cultural heritage as a cost and discretionary; a function of limited focus on culture and cultural heritage as a driver of economic and social benefit.

Yet, the motivation to travel to specific locations such as Tasmania is associated with experiences related to:

- Wilderness & Coastal environments;
- Heritage;
- Culture and
- Food (tourism Tas reference)

These attractors and their interrelationships provide an indicator that the market will respond positively to initiatives that create value from existing tangible and intangible assets to design and deliver new levels experience, interpretation and understanding that in turn generate new or modified value chains, enterprise, jobs and senses of community. Linking these to the growth and changes in the profile of what characterises services as a discrete offer, or as part of a bundle of tangible and intangible offers with the skills and capability characteristics identified as important enablers of participation and productivity generates a scenario where regions can improve their participation in higher value elements of the service industry and ensure people have skills to participate, innovate and further adapt, a positive, virtuous cycle. As services, these offers are "consumed" as part of an interaction with people and place, reinforcing the importance of the Allen skill profile (Allen, et al., 2017), above.

This complementarity of inputs and markets transcends the silo structures and thinking that pervades place, industry and capitals development structures, policies and institutions to form a more complex system than generally recognised in the development frame. The approach demonstrates the value of recognising and utilising complexity to generate new opportunities and value.

The foundations of this cultural heritage value proposition are in place, the challenge is to bring them together in a different way and with a focus on driving economic and social value from an improved understanding.

In its broadest policy sense, this approach facilitates key questions for people and communities –

- Who we are and why;
- Who we want to be and why?

This highlights the dual horizons for such a policy initiative:

- Cultural value facilitating enterprise and employment opportunity in the short to medium term; and
- Cultural values overtly contributing to communities and individuals establishing a vision for the future in the medium to longer term.

The link between the past as reflected in cultural heritage, and its role in delivering community value is to some degree captured in the National Trust (UK) definition - "we think of conservation as the careful management of change". This definition infers a connection between past, present and future that

Provides a rational for societal focus on, understanding and learning rom cultural heritage.

Culture as context

The creation of heritage and flow-on social and economic capital by developing and utilising contemporary and emerging critical thinking, digitization, visualisation and analytical skills that are increasingly in demand, as a mechanism for place development reflects the utilization of endogenous opportunity and provides a link between macro policy and place. In this case integrating tangible and intangible heritage asset and tourism development with vocational education and local application.

This integration provides a horizontal convergence between what are traditionally managed as separate policy arenas and vertical convergence between national and local as a means of propagating macro policy through the country to the benefit of place and people.

The potential of cultural heritage as a development vehicle is ubiquitous. Australia has a diversity of cultures; based on people and place these provide the potential for specialization and differentiation based on this diversity and the temporal context within which the culture, values, tradition and behaviours have evolved and responded to shocks. This requires the potential to be offered in a manner that resonates with and provides relevance to current society, interests and values in terms of the magnitude of their cultural, aesthetic, social, scientific, economic and environmental values and characteristics (Zaman, 2015)

The multiple perspective, integrated development focus challenges the silo based public policy and agency culture and practice and from a place perspective is highly dependent on the local culture and propensity to adopt/reject the principles, the approach and the specific

mix of development interventions and entrepreneurship. While cultural heritage tends to be considered as "the past", the propensity of people in a place to recognize and position cultural heritage as a development vehicle that creates value is dependent upon the culture, traditions and behaviours of the current population in the place; in particular the propensity for cultural heritage entrepreneurship.

This interdependence of the "current culture" with the application of cultural heritage as a place development strategy is highlighted by the "Sagittarius Project" developed by the South East Europe Transnational Cooperation Program and the European Union in 2011. The Sagittarius Project aims to build upon the diversity and culture of South East European countries to contribute to economic recovery post the "global financial crisis". Evaluation of the project identified that, for example, the "*potential for changing in entrepreneurial perspective is moderate to low*" (Valentina, et al., 2016) within the south east European countries compared with the EU countries as a whole. Variation in opportunity perception, rating of start-up and technological absorption as a key input and service characteristic were significantly variable across the target countries.

A further challenge to the creation of capital from cultural heritage relates to the structure of the cultural heritage sector and the distribution between publicly owned assets and enterprises, for profit, not for profit entrepreneurship and socially responsible enterprises and their further scale categorization (Zaman, 2015). The concentration larger institutional, both publicly funded, and hybrid models generates an "authorized heritage" discourse based around these entities, where values and meanings are defined by a significant minority (BABIC, 2015). These finding reinforce the importance of the cultural perspective represented in the meta-framework Each providing a differing context within which there are varied propensities to engage with this form of development.

The development of a new cultural heritage value chain, underpinning a broader range of social and economic outcomes, opens up the potential for wider community and sectoral inclusion; inclusion of the cultural creative industries, ICT and the democratization of access contribute to repositioning the importance, knowledge absorption capacity and the social and economic contribution of the cultural heritage industry (Zaman, 2015) and its impact on people's behaviour, education and training. These factors flag the importance of linking institutions to the use of cultural heritage as a multi-perspective place development platform.

These institutions range from the international to local; commencing with internationally recognized definitions; "*Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage* (ICOMOS, 2002).

Australia's cultural heritage, as with much of the first world, is generally associated with tangible (material) objects or artefacts. These are generally held, protected and conserved as a form of capital as landscapes, buildings, moveable artefact and information collections. Other societies view their cultural heritage as stories, traditional customs/practices and events,

a more intangible representation. UNESCO highlights the tangible and intangible as two key, important dimensions to cultural heritage, indeed the intangible perspective provides a basis on which meaning and therefore value is attributed to the tangible. Combining the two dimensions is arguably critical in constructing the relationship between place, people and social/cultural identity – capital and knowledge that contribute to continuity.

The differentiation of culture as external (the material) and internal (knowledge, interpretation) breaks the limiting nexus between place and cultural heritage and facilitates broader participation and engagement while it also allows for different internal cultures to attach to particular location and with this raises contested interpretations (Graham, 2002) of culture.

Heritage is a diverse knowledge with many sources and meanings. It is meaning that gives cultural or financial value to the material artefacts and explains why they have been selected from the infinity of the past and often later discarded as the needs of present societies change (Graham, 2002). Graham proposes (Graham, 2002, p. 1004)the "*if heritage is the contemporary use of the past, and if its meanings are identified in the present, then we create the heritage we require and manage it for the purposes defined by the needs of our present societies*". In this context meaning is derived from both the content and the inclusive and knowledge/skills building that creates new capital in a place.

The source of new capital is premised on the conclusion that heritage is a resource that can be used simultaneously for a range of purposes, notably economic and cultural. The cultural dimension has equally been the focus of driving constructive change in societies and places:

- Culture as a vehicle for economic growth,
- Culture as an instrument for reconverting cities,
- Culture as a tool for integration and inclusiveness, and
- Culture as a pillar of place-based identity within the place and beyond (European Economic & Social Committee, 2016)

The potential for integration of cultural heritage and with other creative aspects of culture, extends boundaries and possibilities.

Heritage places are places of consumption (Sack, 1992), markets influence place-making and place-altering, their physical fabric is a finite resource, while their interpretation can be continuously renewed to match market needs. This highlights the potential tensions between cultural heritage, development and amenity and the contribution of ICT and interpretation, providing a new model for cultural consumption (Valentina, et al., 2016) while also creating the capacity for new forms of on-site cultural consumption as recreational learning based on new cognitive content, on innovative comparison between the old and contemporary. This reinforces the symbiosis of the tangible and intangible perspectives.

Inherent in this concept of tension is that of the exploitation of intellectual capital, in particular the rights of transformation of indigenous intellectual capital into an economic asset as the means to achieve benefit through interpretation.

Lowenthal (1985, 1996) notes four traits that interpretation of heritage confers as social benefits:

- Underpins the idea of continuity and ethos of progressive, evolutionary, social development;
- Emblematic landscapes in which certain artefacts acquire cultural status;
- The past provides a sense of termination, what happened has ended; and
- By offering a sequence, it allows people to locate their lives in linear narratives of past, present, future.

Building on these traits can enhance aspects of community, senses of identity, values, narratives of inclusion and exclusion and associated socio-political constructs. Re-creation and re-interpretation of culture through time and influences, highlights that much of Australia's cultural heritage, as indeed it is across the globe, is influenced by migration and the resultant combination of cultures. Migration provides for both the development of new, blended cultures and a visitor market, searching for cultural heritage links.

The complementarity of the tangible and intangible becomes increasingly important as the direct, personal connection that helped attribute value to an artefact diminishes with time; without a narrative or activity to ensure relevance, elements of meaning and importance are lost. The connection between past, present and future to generate meaning and value is critical if cultural heritage is to deliver value to society. Achievement of this connection requires more than inclusion of "facts".

The concept of "authorised heritage" and notions of bounded cultural heritage is linked to the institutionalisation of heritage entities and associated professionals (insider and outsiders) as opposed to consideration of "heritage as life values" (Josefsson J, 2016). The distinction that what is in the past is history and that cultural heritage is contemporary is made on the basis of the interpretive prerogative being open to any-one and the challenges of collective heritage.

"Cultural value" arguably requires the connection between the utilisation of culture and cultural heritage and delivery benefits within contemporary society – an inquiry, consideration and conclusion construct.

The following section provides an overview of the application of the meta-framework and its associated development pathways construct to a development pilot program in response to the above challenges and the potential to utilise macro-policy and issues to place through the development of localised endogenous characteristics and capitals; in this instance a cultural capital that is often latent or underutilised.

Pilot Program Structure

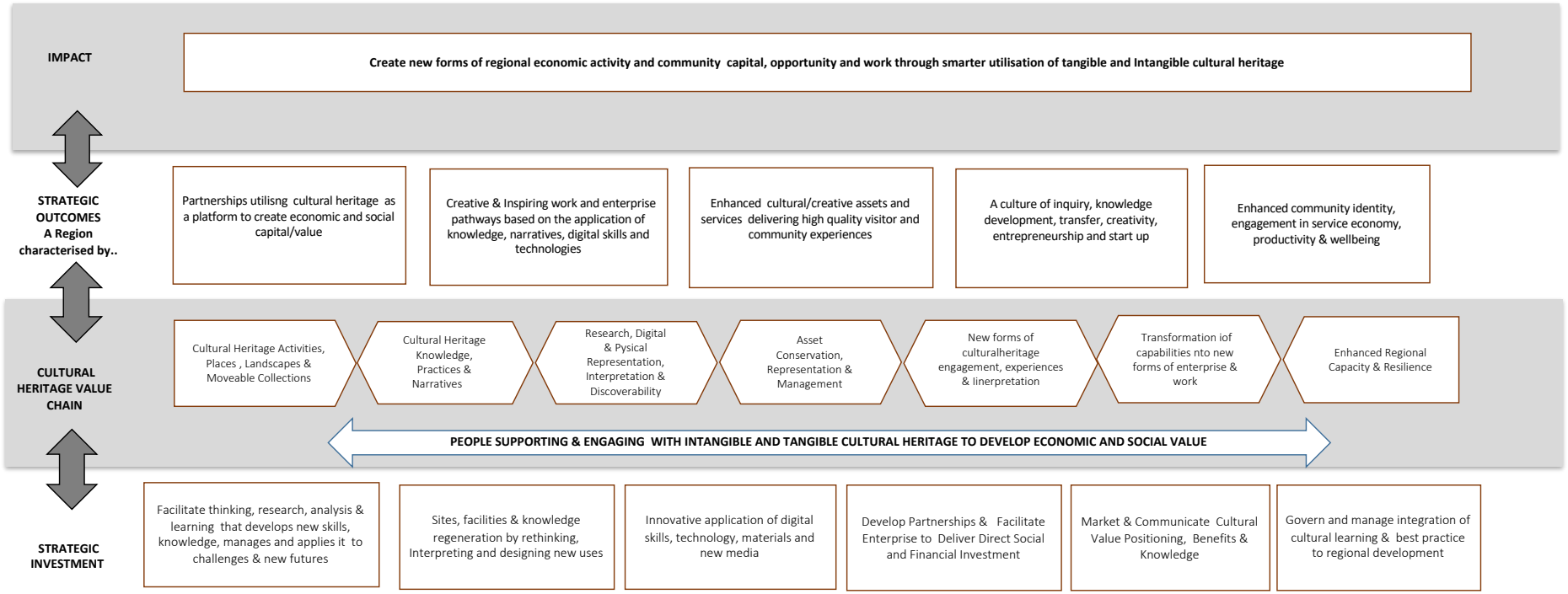
This program was initiated by a Memorandum of Understanding (MoU) between The University of Tasmanian and the National Trust of Tasmania and prepared as a proposal for investment from Australian Government funding programs and other sources and the engagement of agency, local government, community entities and individuals in its support and implementation.

The pilot program design differs from traditional silo approaches by applying multiple perspectives to a national pilot program. It includes and innovatively combines social, built heritage, technical, cultural, economic, enterprise, environmental, regional development, tourism and creative perspectives to act in an integrated, rather than traditional, isolated "silo" manner. This is arguably critical in place development and in the enhancement of community capital to support regional development, adaptability and resilience. This enable an innovative "dynamic systems logic" approach to regional development.

The pilot program methodology enables codesign of the model in a form that can deliver multiple streams of value from the cultural heritage base to deliver the outcomes identified above through this cultural benefit productive value chain. This is consistent with the ability for cultural heritage to enable multiple, simultaneous uses, without degrading the resource. Integration of both intangible and tangible cultural heritage is designed to create a more engaging and beneficial foundation for both community and visitors.

The preceding discussion integrating contemporary skills in demand, cultural heritage tourism and place development provides the pilot program context; the multi-perspective focus and the policy interdependencies that define this program; the associated themes and responsibilities that require a matching implementation, management and evaluation framework. These factors are captured in the meta-framework representation of the program. This draws together a range of themes that are important for a place to continue its relevance in a contemporary market increasingly dominated by services as discrete offers and as key complements to traditional production and its attractiveness to people who seek to participate in the service economy, in particular, higher value services underpinned by professional qualifications and digital capability.

Figure 6.1. Endogenous Cultural Heritage Development Meta-framework



The meta-framework used to represent and design the program has three critical dimensions:

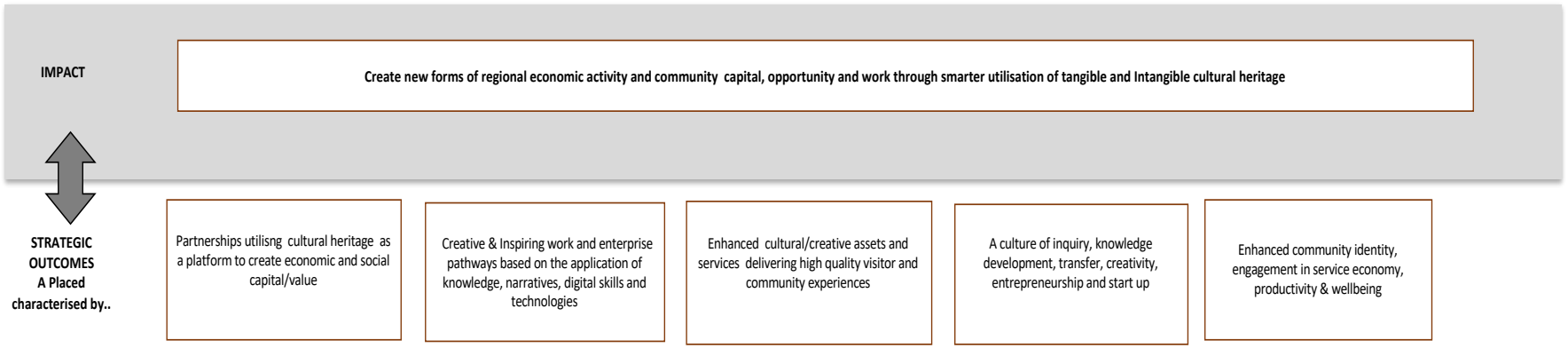
- The strategic intent, incorporating the strategic outcomes and long term motivation;
- The operational model combining value chain that frames the program scope and the interventions that are applied to the value chain to deliver outputs and contribute to the defined outcomes; and
- The cultural filter that influences the change management through the strategy mix.

The program is reflective of the themes and aspects discussed above.

Strategic Intent

The strategic intent, summarized in the Fig 6.1 below, is designed to specify the aspirations of the program, clarify the program's impact and specific contribution to the performance, productivity and resilience of the places engaged in the program. This is premised on working towards the outcomes through smarter utilisation of its tangible and intangible cultural heritage. The focus is on achieving outcomes that reflect national Heritage Tourism and service economy skills policies at a place level by developing its tangible and intangible cultural heritage stock. This can further contribute to regional performance, productivity and resilience by applying the skill sets to other local sectors and industries.

Figure 6.2. Endogenous Cultural Heritage Development – Strategic Intent



The outcomes are interdependent, each providing a key building block to deliver the preferred economic and social future.

The outcomes were framed to define and clarify, in terms that can be measured in quantitative and qualitative terms, the benefits sought from the pilot as a demonstration project and are outlined below.

Productive Regional Partnerships

Australian regions differ in their capacity and mix of players within the development, education, cultural heritage and tourism sectors. This national project is designed to transfer the model into specific locations by facilitating and complementing partnerships and roles that provide the capacity to design and implement the model.

The outcome is designed to bring together key research, policy and practice oriented agencies and enterprises. This ensures existing sector and enabling stakeholders combine with local formal and informal structures and communities to combine their knowledge and resources, deliver structured learning, implementation and evaluation. This is further designed to create an enduring social capital that can be applied to other arenas.

In the Tasmanian context, the national pilot project combined the National Trust, the University of Tasmania, other state agencies and regional counterparts to act as both facilitators and capacity builders to bring together necessary resources to provide an organizational and governance foundation that is nationally consistent, but also reflective of specific regional characteristics. This integration of players is defined in Fig. 6.3. below.

Creative work and enterprise pathways

The ability to generate new creative, cultural industry employment from a region's cultural assets is driven from a demand for active, rather than passive, tourism and community experiences, both on-site and through digital experiences. This enables "new-economy". Contemporary and creative cultural jobs to be developed in regions.

These new forms of work, enterprise and employment are a critical complement to enhanced traditional conservation and maintenance jobs. The research, interpretation and digital economy skills are critical to providing contemporary career pathways in regions that provide a linkage to new service economy skill paths.

Further to this the integration of, and balance between, digital and crafts techniques in heritage asset conservation and maintenance also enables jobs to be redesigned providing a more attractive option to new and younger entrants than traditional craft-based employment. This supports the transferability of skills between the heritage sector and other construction sectors, helping to address apprentice and skilled employee shortages.

The contemporary skills and knowledge bases are highly transferable to other sectors and places. This contributes to assisting those who migrate from the regions to relocate with improved career prospects.

The model has the capacity to also attract new entrants to the regions; those seeking a career founded on cultural heritage and the new model.

Enhanced and integrated creative, cultural heritage and tourism delivering increased tourism value and community benefit

The program is designed to deliver a stronger, more valued and productive cultural "industry" in the regions; to create value. The aim is to conserve and develop cultural knowledge and assets as the base from which new careers, economic and social benefit can be derived. Cultural assets within regions will be conserved, maintained, adapted and re-used as part of a re-formed cultural heritage value chain. Integrated with the intangible knowledge and practice dimensions of cultural heritage, are potentially able to be repositioned to deliver strong economic and social benefits through a mix of community engagement, community capital development and enterprise that matches market demand.

Intangible creative sector activities, digital technology, arts and tourism, "book-end" the traditional conservation and maintenance of tangible landscapes, sites, building and collections. They provide research, interpretation, digitisation, visualisation and representation employment and enterprise opportunities that provide a lead into the physical work around conservation, maintenance and adaptive re-use. These are designed to lead into new tourism channels and markets with their enterprise and employment opportunities.

The approach enables each place to showcase its unique cultural assets and identity to provide new, more engaging offers and experiences for visitors and the local community. This sense of identity is key to the provision of authenticity, attraction and retention of visitors. The associated increase and diversity in revenue provides the ability of the wider community to engage in the cultural heritage tourism value chain.

The digital base to the program provides the ability for the region, its assets and businesses to engage through the web and social media with global interest groups. This is highly targeted marketing for the regions.

A culture of inquiry, creativity and enterprise

The model is first and foremost about maintaining and developing community capital as a means to nurture successful enterprise. This includes development of its cultural, social, intellectual and financial capital stocks and flows in a manner that contributes to regional prosperity and resilience to provide people with contemporary, transferable knowledge and capability that underpins meaningful, rewarding careers.

There is a strong focus on innovation and enterprise; making better use of existing cultural knowledge and assets and the human capital that exists within regions. The "enterprising" foundation that underpins the program is designed to extend, and in some places, establish a more independent, resilient frame within which people and communities operate.

The model is designed to practically reinforce the past, present, future continuum and to facilitate key questions:

- Who are we? and why?
- Who we want to be? and why?

These are arguably critical questions that can impact the future of places.

This reflective approach, combined with ICT enables, for example, schools and students to engage with other global communities and develop a sense of identity with their cultural heritage and an understanding of others and their cultures and values.

Enhanced community identity, engagement, productivity and wellbeing

An understanding of, and connection between people and their cultural heritage is strongly related to establishing and maintaining a sense of identity and values for individuals and communities; identity and the sense of belonging is a key determinant of wellbeing.

This outcome focus is designed to achieve this, at times latent, potential to engage communities, students and enterprise with recognisable culture as the basis for economic and social benefit. The creative and constructive utilisation of a currently underutilised regional cultural asset can be a direct contributor to regional productivity, making better use of existing assets.

Cultural heritage is a sustainable resource (Sack, 1992), able to be used simultaneously and further developed by numbers of people and enterprises without putting it at risk. On an ongoing basis it is able to further evolve, be re-interpreted and represented to others in a relevant, engaging way.

Nationally, cultural heritage provides diverse communities with the opportunity to respectfully and creatively leverage significant social and economic dividends from their culture.

The achievement of these objectives is the focus of the program's operational focus.

The Operational Structure, Capacity Building and Implementation Strategies

This operational delivery component of the program combines the value chain and the mix of interventions to be applied collectively and individual to elements of the chain in different weights and intensity. The value chain reflects an extended version and disrupts existing elements through innovation, factors attributable to the introduction of new technologies, skill sets and thinking frames.

Motivated by the need to supplement traditional regional development approaches, the program has four major themes:

(1) Conservation and regeneration of important cultural assets within communities, their enhanced interpretation and representation within the context of their place, development values/rationale and the people involved with and affected by them; IMPACT: **delivering jobs and skills and enhanced assets, enhanced cultural capital.**

(2) Development of new service economy, key traditional and integration of creative industry skills and techniques with heritage conservation, maintenance and interpretation knowledge and skills sets. For example, the application of digitisation and visualisation technologies, to create jobs leading to new, active and multiple ways of connecting with and presenting cultural heritage by developing unique, new wave, tourism experiences to match current and emerging visitor market demands. This demonstrates strong employment multipliers. IMPACT: **attracting and retaining people into labour market and productive regional development activities; enhancing the offer of existing tourism enterprises; developing transferable, contemporary skills, increased human capital.**

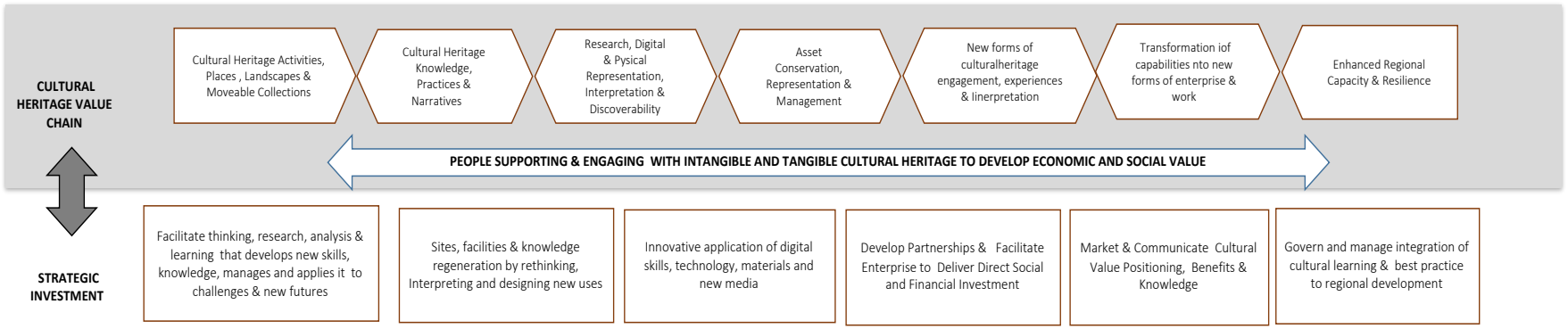
(3) Diverse community engagement, partnerships and the development of an enterprising culture that takes advantage of the largely underutilised tangible and intangible cultural heritage that abounds within regions. This will deliver economic and social benefit by developing intellectual, social and cultural capital and contributing to a strong sense of place and identity. IMPACT**: commercial and social enterprise start-ups, regional resilience, new social capital**

(4) The evidence-based transfer of knowledge and process to other regional jurisdictions and to other arenas as a result of rigorous evaluation to further define the impact of the mix of interventions on regional development and resilience. IMPACT: **A new, validated approach to contribute to regional performance, productivity and resilience across Australia**

These themes were translated into program design and on-ground operations through the following value chain and associated strategy mix. The value chain moves from the asset based (both existing and potential) through the broad steps/links that lead to strong regional positioning in the visitor market. The strategy options will be applied to steps and the value chain overall.

The value chain and capacity building strategy mix are represented below:

Figure 6.3. Endogenous Cultural Heritage Development – Formative Investment and Practice



The model is designed to apply the strategy mix to each element of the value chain and to the chain overall to ensure it works effectively and efficiently as a value chain and that it contributes strongly to the outcomes identified above.

Research, learning, creating and managing new knowledge

The initiative's "cultural heritage value chain" will be initiated with the development of new knowledge and skill sets that will contribute to the identification and realisation of opportunities that provide new sources of value to value to communities and Australian society.

Founded on the University of Tasmania "Creative Communities" model and program, its multi-disciplinary links and action learning within the community setting and the application of this knowledge and specific skill sets leads into key transferable domains including:

- Knowledge management;
- Communications;
- Curating
- Creative technologies
- Creative industries
- Building Information Management
- Heritage architecture, adaptive re-use
- Built heritage conservation and restoration crafts
- Enterprise development
- Marketing
- Experiences, events and hospitality

These specific domains will be integrated in a manner that reflects the specific project locations within the program.

The education, training and experience is designed to provide people with knowledge and skills sets readily transferable between industry sectors and locations. Critically they provide "new-economy" capabilities that can be used to leverage value within regions as well as preparing people with these transferable contemporary labour market capacities. The underpinning research, analytical and critical thinking capabilities developed will support individuals' and groups' capacities to adapt further to the changing needs of markets by gaining the knowledge and experience to apply them in other and emerging domains.

The education and training mix were based on provision from resources drawn from schools within University of Tasmania and other key partner institutions, State Skills Agencies and professional organisations.

Existing programs and expertise are to be recruited to ensure ongoing collaboration and delivery post pilot.

Site and Facility Regeneration

Regeneration is a central program principle. This reflects the ethos expressed by the National Trust (UK) that "conservation is about the management of change". Linking to this, "regeneration" in this national initiative is represented as an active form of change management:

- The physical regeneration through both conservation, repurposing and adaptive re-use as active, engaging and vibrant locations for communities and visitors;
- The generation and regeneration of knowledge that supports understanding and its application within multiple cultural perspectives; and
- The generation of new career paths based on new knowledge, creativity and digital skill sets.

Regeneration when applied to community cultural heritage assets such as sites and building, assists to break the nexus with conservation and maintenance as a fairly tired phrase that people put into a "cost" box. Regeneration implies a positive future and investment that provides a return on that investment that goes beyond adaptive re-use.

This regeneration principle was considered central to the development of the cultural value concept and its wider recognition as a contributor to positive economic and social outcomes within regions.

A program delivery table was prepared to schedule the specific project profiles. This included a range of streams and projects selected to provide a mix of contexts reflective of mechanisms that are likely to exist to some extent across Australia's regions.

Innovative application of technology, materials and new media to enhance discoverability and engagement

Application of new technologies and the integration of research, communications, creative, trades and visitor services sectors skill sets provide the tools, while the sites and buildings provide the platform to create new ways of looking at, working with, and presenting cultural heritage. The outputs from these include:

- The cultural research, interpretation and creative elements provide the opportunity to develop and apply leading edge digitisation skills in visualising, representing and enhancing discoverability of the cultural themes associated with a particular location;
- New digital tools for capturing information, analysing and representing built structures and landscapes, along with new material technologies, combined with traditional crafts, provide the opportunity to improve productivity and outcomes in conservation and maintenance;
- Digital access through web sites and mobile applications provide wider market discoverability and access to the sites and their cultural themes, interpretation and representation. These resources provide the platforms for event and tourism enterprises based on the sites; and

- New resources to enhance the on-site place-based experience for people with diverse interests.

Develop Partnerships and Enterprises

The national pilot project has identified key partners and stakeholders in regional Tasmania that reflect potential partnerships across Australia's regions.

The core partners in each region included National Trust Australia (and its State entities), University of Tasmania (and its partners), State heritage asset managers, heritage specialist organisations and local government. In each region, key regional (and sector) development organisations, tourism groups/entities will provide the core enterprise development capability.

Market and Communicate Cultural Value

The notion of cultural value is ill defined, marginal and perceived as irrelevant in much of Australian society. Funding culture is perceived as a discretionary cost, rather than as an investment that provides a competitive social and economic benefit/cost return.

The program is designed to demonstrate and articulate the potential economic and social opportunity and benefit available by developing cultural value in a regional jobs and growth strategy.

There is a significant range of overlapping audience segments for this:

- All three tiers of government;
- Communities;
- Heritage organisations;
- Students/youth
- Education
- Development agencies
- Tourism

Govern and Manage

Applying a multi-perspective, "systems" framework to regional development necessitates a form of governance that reflects its structure and the associated design, implementation and evaluation thinking.

The pilot program included a governance and management framework that supported productive partnerships within this context and the critical balance across strategic and operational dimensions at the regional and national levels. The meta-framework and its associated structures and tools provided the base enable the design, implementation, evaluation and adaptive management of the national program and its regional roll-out.

Within each region there exist a range of commercial, community and public sector partners whose capabilities and networks are to be integrated into, and potentially further developed by, the initiative.

The pilot project and its roll-out to other regions will be governed within the following systems logic framework and its adaptation arising from the pilot and evaluation. This framework is a consolidation of the strategic and operational dimensions outlined above, facilitating a dual strategic and operational focus within the governance framework across its multiple perspectives.

The program Management Committee is at the centre of the governance model. It is informed by the working groups. The program theme working groups will operate collaboratively to provide the program wide input through the Program Management Committee and the subsidiary management and operating procedures. Similarly, the *stream* working groups will take management of the specific streams and facilitate collaboration between them.

Specific projects and their integration with the program wide themes will utilise standard project management practice.

As the pilot program is based on building regional capacity, other key operational partners have been identified. Within other Australian regions, counterpart partners will be identified.

The strategic contributions of these partners across the pilot program value chain is clarified below. Specific theme and project working groups will be formed to implement the pilot value chain in a structured, professional manner.

Partner and Stakeholder Contributions

Movement to a dynamic systems logic, from a traditional silo construct requires a mechanism to clarify roles and relationships within the governance and management model.

The national pilot project aimed to design a model that is transferable to other Australian regions. The approach is focused and collaborative, supporting co-design of an initiative that reflects the community capitals specific to that place. The following diagram highlights the range of potential players, (as representatives of community capitals) their primary value chain focus, and contribution through the mix of initiative strategies.

Two critical questions were framed to clarify the connection between the micro perspective, place and the macro policy challenges and the contribution from the program stakeholders.

1. How would success in each element of the value chain contribute to program outcomes; and
2. Who will apply the tools within the strategic investment elements to the value chain?

Question One creates a link between the operations (micro dimension) and outcomes (meso/macro dimensions; this reinforces an outcomes orientation.

Question Two structures the linkage between the specific strategic investment elements (interventions) and the value chain.

The summary response to these questions are provided in the tables below. Figure 6.4 , developed in conjunction with project team stakeholders, provides a specific, indicative link between the cultural heritage value chain outputs and their contribution to the outcomes sought.

Figure 6.4 Contribution Table

		OUTCOMES				
		Partnerships utilisng cultural heritage as a platform to create economic and social capital/value	**Creative & Inspiring work and enterprise pathways based on the application of knowledge, narratives, digital skills and technologies**	**Enhanced cultural/creative assets and services delivering high quality visitor and community experiences**	**A culture of inquiry, knowledge development, transfer, creativity, entrepreneurship and start up**	**Enhanced community identity, engagement in service economy, productivity & wellbeing**
CULTURAL HERITAGE VALUE CHAIN	**Cultural Heritage Activities, Places , Landscapes & Moveable Collections**	Integration is the basis for new collaborations, partnerships & synergies, Collective voice & demonstration of value	New research, business and employment opportunities	Builds on 3 primary motivators for people visiting Tasmania	A non diminishing resource, able to be exploited from many perspectives and users simultaneously	Foundations of who we are, how we fit & who we want to be - Communities as proud custodians and utilisers of cultural heritage
	Cultural Heritage Knowledge, Practices & Narratives	Extending knowledge, skills - including didgital technologies to practice	New and enhanced, contemporary jobs	New experiences, motivation to visit	Lessons for future from past	Linking intangible to the tangible resonance and relevance
	Research, Digital & Pysical Representation, Interpretation & Discoverability	New partnerships between people and technologies		Off-site discoverability, On-site experiences	new enquiry, ceative interpretation & contemporary experiences	Awareness, knowledge & connection
	Asset Conservation, Representation & Management			Ordering & Presenting cultural assets in a form that helps people understand their relevance, potential and value	Inspiration	Tangible and intangible demonstration of history, cultural heritage and identity
	New forms of culturalheritage engagement, experiences & Inerpretation	Strong linkages to tourism and labour market organisations	New jobs, courses and combinations leading to dynamic, adaptive utilisation	Participation and gaining value, insight and inspiration from cultural/creative experiences	New enterprises that fit creative economy positioning	Community based activity, revenue, jobs and futures - transfer of creative culture to other regional sectors
	Transformation iof capabilities nto new forms of enterprise & work	Link heritage, cultural and creative sectors	New knowledge leading to new opprtunities and forms of productive employment	New ways of thinking about, presenting and offering	Sparking	A culture of creating from what we have
	Tasmania's Positioning	Capacity to exploit and further develop cultural and human capital to social and economic advantage	Expansion of creative industry enterprise & employment	Building on Tasmanian competitive advantage to provide unique offerings - visitor experience, livable communities	Individual and regional enterprise profile	Enhanced reputation and performance

The following diagram subsequently places partners within the operational framework by linking their strategic contribution to the program value chain. The "cells" identify a primary responsibility and contribution: however, this does not imply that stakeholders will also contribute to other development pathways.

In combination they provide a picture of the strategic context for elements of the value chain and how stakeholders will then impact the value chain by investing specific capital into the value chain.

The provide the structure within which design and implementation occurs.

The framework highlights the scope and complexity of the proposal and the need for an overarching governance, combined with subsidiary relationships with key players. Again, combining framework dimensions in a table representing the dual focus of development pathways (activity by strategy) allows the key players to be identified in the resultant cells. In this example, the National Trust appears as an entity and is also included in "property owners" and "sites".

Combining the player cell, with their activity and strategy focus supports the development of agreements (such as that with TMAG) that are focused on the outcomes sought and considered within the context of the framework and the contribution of other players.

The same table format (figure 6.5) was used to identify specific projects that fit the cell, rows or columns. Although "cell based" the approach is designed to help ensure multiple perspectives are included, projects contribute across rows and columns.

In combination, the framework and subsequent tables are designed to guide a constructive conversation of the proposal, reflection of its aims and content and deliberation in terms of engagement and governance based on the achievement of strategic intent.

Figure 6.5 Development Pathways and Partner Contributions

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="5">STRATEGIC INVESTMENT</td></tr>
<tr><td>Facilitate Thinking, Research, & Learning that creates new knowledge, manages and applies it to challenges & new futures</td><td>Sites, facilities & knowledge regeneration by rethinking, Interpreting and designing new uses</td><td>Innovative application of digital technology, materials and new media</td><td>Develop Partnerships & Facilitate Enterprise to Deliver Direct Social and Financial Investment</td><td>Market & Communicate Cultural Value Positioning, Benefits & Knowledge</td><td>Govern and manage integration of cultural learning & best practice to regional development</td></tr>
<tr><td rowspan="8">CULTURAL HERITAGE VALUE CHAIN</td><td>Cultural Heritage Activities, Places Landscapes & Moveable Collections</td><td rowspan="2">Utas, Museums, Libraries, Parks, Nat Trust, Councils, Property Owners</td><td colspan="2" rowspan="2">Utas, National Trust, Parks, Heritage Tasmania, indigenous organisations, professions</td><td rowspan="2">Public & Private Owners</td><td rowspan="4">Utas, National Trust, Heritage Tasmania, Museums, Libraries, Parks, Arts Tas,</td><td rowspan="7">National Pilot Management Committee, Specific regional structures in roll-out to Australian Regions</td></tr>
<tr><td>Cultural Heritage Knowledge, Practices & Narratives</td></tr>
<tr><td>Research, Digital & Physical Represntation & Interpretation</td><td colspan="3">Utas, National Trust, Tas Building & Construction ITB & project owners</td></tr>
<tr><td>Asset Conservation, Representation and Management</td><td>Museums, Libraries, Parks, Nat Trust, Councils, Property Owners</td><td colspan="2">National Trust, Parks, governent, Centre for Heritage, Building & Construction Industry Training Board, TAFE and community property owners, private owners</td><td>Museums, Libraries, Parks, Nat Trust, Councils, Centre for Heritage, Property Owners</td></tr>
<tr><td>Transformation into new forms of enterprise & work</td><td>Utas, National Trust, Skills Tasmania</td><td colspan="2">Utas, Arts Tas, Skills Tasmania, TAFE, Education Dep't in partnership with owner and communities</td><td>Federal & State Government Development Programs</td><td rowspan="2">Tourism Industry, Nat Trust, Skills Centres, Skills Tas, Communities</td></tr>
<tr><td>New forms of Engagement, Experiences & Interpretation</td><td></td><td colspan="2">Tourism Industry, Nat Trust, Skills Centres, Skills Tas, Communities</td><td>Tourism Industry, Nat Trust, Communities, Councils & regional development entities</td></tr>
<tr><td>Enhanced Regional Capacity & Resilience</td><td>Utas</td><td>National Trust, Parks, governent and community property owners, private owners in conjunction with tourism sector</td><td>Utas, Tasmanian Government</td><td>Utas, State, Local Government & Regional Entities</td><td>Utas, Arts Tas, Brand Tas, Tourism Tas</td></tr>
</table>

Conclusion

The meta-framework approach and its associated representation and analytical structures, demonstrate the capacity to support consideration of structured, systemic intangible regional development investment (Productivity Commission, 2017); the challenge in linking macro-policy to place outside support (Productivity Commission, 2017) (Varga, 2015) and the dominantly top down, space blind philosophy, with little or no coordination between programs organised by different government agencies (Barca, 2009).

This capacity is a consequence of establishing specific place-based outcomes that create the link between the macro-policy and a local endogenous capacity with market development potential that has meaning for people in that place. This connection is not a purely technical exercise.

Endogenous capacity is both a technical and social construct. This case brings culture to the forefront as a determinant of the profile of capitals able and suitable to be applied to the perceived opportunities that are available in the socio-technical context of place. This has a number of implications, including:

- Propensity to recognise and exploit opportunities;
- Create varied levels of tension between cultural and economic goals; and
- When intangible culture is included, who owns and has the right to utilise this for economic benefit.

The inclusion of the "cultural filter" across the meta-framework is important in developing a contextual response to implementation of macro-policy at the place level, in designing interventions, the use of co-design principles that include both multiple professional perspectives and muti-cultural perspectives. These social perspectives, as identified in "authorised heritage" extend beyond values, to power relationships and meaningful engagement and participation.

The ability to represent the framework in a form that reflect diverse places and the inclusion of the cultural filter allows the model to be applied and its elements weighted to specific contexts.

The meta-framework enables the representation of these connections and design of a multi-perspective investment mix that will generate future streams of employment and income. This income can be derived from:

- Flow-on enterprise directly from the program;
- Application of the knowledge and skills to other sectors within the place;
- People developing a knowledge and skills base that will allow them to participate in other labour markets; and
- Participate in the export of services from the place.

These are not mutually exclusive options, in combination they demonstrate that the impact can be local, in place, or more widely distributed across the economy.

The multi-perspective approach to this form of program design delivers a strong benefit-cost relationship (BCA), a factor identified as important in regional development to ensure optimum returns on investment across multiple place perspectives.
The strong BCA ratio is based on:

- The high multiplier effect of infrastructure investment;
- The development of human and social capital that complements the infrastructure to develop services for remote and visitor markets;
- The ability to apply the knowledge and skills to build new and productively disrupt existing value chains in the place; and
- The further application of knowledge and skills to other arenas within the place and transfer to productive uses in other places.

Alongside these benefits are aspects, not often quantified, that are reflective of the changes in the positioning and status of the place and its flow-on from improved capital stocks to its performance, productivity, amenity and ultimately its resilience.

The omni-directional flow of signals and catalytic capacities within the system are highlighted in this approach and the critical role of community capitals in "spiralling up" (Emery & Flora, 2006)as a consequence of considered utilisation of macro-policy and place development

CHAPTER SEVEN - ANALYSIS

Introduction

This chapter analyses the application of the meta-framework approach in assisting to develop policy and strategy that reflects "real world" characteristics and conditions through the manner in which it helps represent, understand, explain and utilise complexity in a place-based development setting.

The case studies demonstrate the application of the meta-framework approach in practical, place- based settings, demonstrating it as a public policy heuristic and tool. The stance adopted in these cases is that the underpinning purpose of policy and strategy is focused on livelihoods (Scoones, et al., 2007), quality of life (Torgeson, 1986) and innovative designs that influence people's futures and help to better tackle day to day problems (Hoppe, 2018).

The analysis identifies how the meta-framework approach demonstrated in the case studies assists to identify, represent and explain place and people connections, dynamics and contestability necessary for meaningful place-based policy and strategy intervention.

Firstly, the factors associated with the "connected, dynamic and contested" aspects are identified to form the basis for the analysis of the contribution that the meta-framework approach makes to addressing these within the case studies. Secondly, the case studies are considered in terms of the value of the meta-framework and subsidiary tools in assisting in the representation, understanding and explaining the complexity factors as a requirement for policy/strategy development.

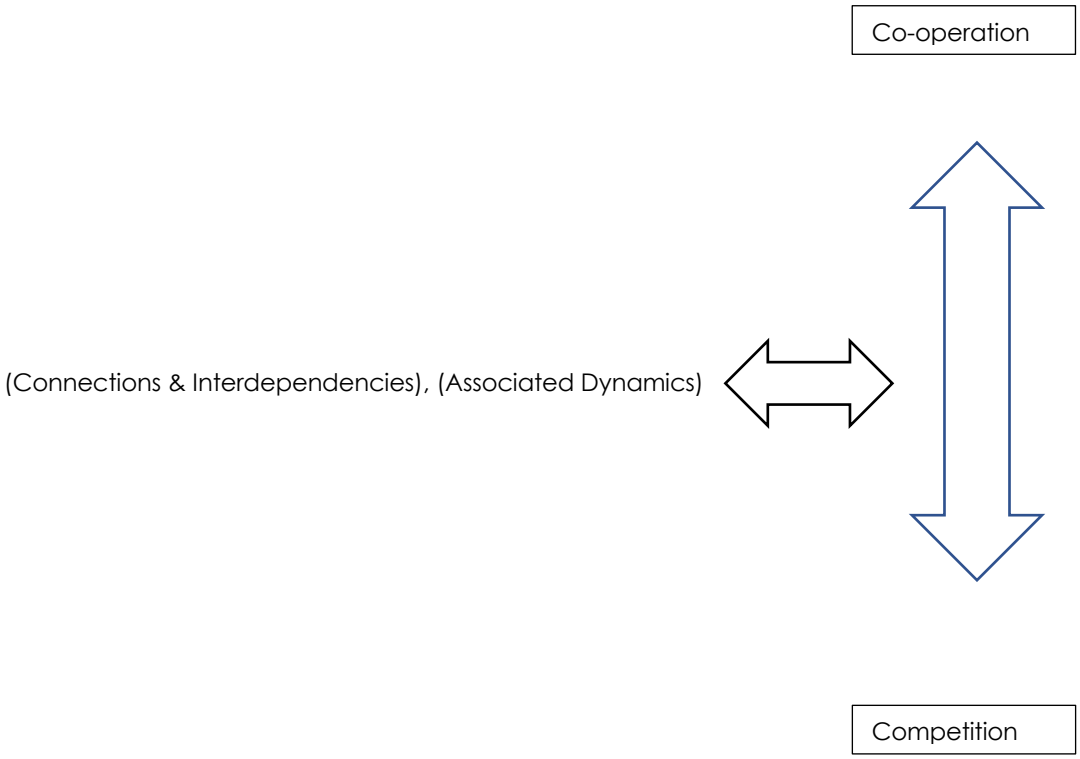
The Complexity Variables - connections, dynamics and contestation

The interrelated variables, ""connected, dynamic and contested"" discussed in Chapter Two, and their conjoint relationship as sources of complexity, form the criteria for analysing the meta-framework and associated tools as an appropriate approach to the representation, understanding and explanation of a policy arena to support development and management of policy.

Each of the cases exhibit forms of the "connected, dynamic and contested" parameters. The research has highlighted that contestability is not a binary characteristic. The degree of contestability can be considered as a point on a continuum drawn between cooperation and competition, the two states identified within the management of common pool resources (Ostrom, 1999). These states have behavioural parallels with Herzberg's "satisfiers and dissatisfiers" categories in hygiene theory (Herzberg, 2017), having some central point of ambivalence, where neither state occurs and when moving to one state or another, a tipping point where activity is motivated; impacting the evident contestability. The relationship

between connected and dynamics with the contestability variable is demonstrated in Fig 7.1 below.

Figure 7.1. Connections, Dynamics and Contestability States



The adverse consequence of policy made in ignorance of the tipping point can be profound. Fig 7.1, above, is designed to indicate that the connection and dynamics variables can result in degrees of cooperation, rather than contestability or when involving a range of factors result in diverse degrees of contestability amongst those factors, significantly impacting the complexity of the policy environment.

This introduces the influence duality of contestability. Policy can be positioned as responsive and active, the first mitigating competition and the second facilitating cooperation, in particular policy circumstances combining elements of each; these are not mutually exclusive and often co-exist in the place context. Contestability is derived from multiple sources, propagating as dynamics within different time and distribution patterns in combinations that at times moderate impacts and at other times and circumstances escalate them.

The manner in which policy is made is also contestable. The proposition that policy and its incremental change is perceived as a legacy of previous authoritarian decisions; yesterday's answers to today's problems and consequently not reflective of innovative design to positively influence futures (Hoppe, 2018). The Hoppe proposition highlights the relationship between contestability as a broad concept of competition as a source of innovation dependent upon how the signals are interpreted.

To provide the basis for analysis, the following outlines the general fit between the meta-framework and factors identified as important in the development of the place, people and policy congruence within the combined Torgeson, Scoones and Hoppe stance identified above.

Connected

The meta-framework and its associated processes and tools assist in addressing aspects of connection that have been identified as important, in policy generally and place-based policy in particular, including:

Structure

Providing the tangible representation of the policy arena:

- The bi-directional connection between strategy (macro-meso) (Varga, 2015), activity/practice/outputs (micro) for example implementation of a national policy or program agenda and the practice impact of global questions and the input (formative capitals) dimensions (Scoones, 2009) (Arthur, 2013);
- The inclusion of multiple perspectives within each of these dimensions (Hoppe, 2018) promoting and enabling multi-disciplinary approaches and inclusion of "lay input" into a policy process that counters the traditional single sector or single tool approach;
- Mapping the elements and building blocks of the system (Ostrom, 1999);
- To identify and discover interdependencies between the elements and that "make up" the system, omni-directional cause and effect.
- The connection between the application of capitals to activities (and their value chain) to provide the inputs for livelihoods derived from production and services (Scoones, et al., 2007);
- Allowing perspectives and dimensions to be selected and moved to the foreground for consideration (Arthur, 2013) (Hoppe, 2018),
- Decomposing, dissembling and re-assembling to allow specific elements to be considered, while binding the whole in a coherent pattern, and new relationships to be discoverer (Hoppe, 2018) (Ostrom, 1999)
- The connection between the culture of a place and its capacity for endogenous change, creativity and innovation and its response to exogenous pressures and shocks (Scoones, 2009)

Overlays

Providing the means to moderate the tangible elements by identifying intangible cultural and power influences:

- A place-based cultural overlay that is a determinant of the values, mechanisms and behaviours of formal institutions, mechanisms and leadership, informal mechanisms that influence what outcomes are sought, which options are viable and how they are implemented (Hoppe, 2018);

- Inclusion of multiple perspectives reflecting the aggregated into ecological, economic and social each of which with subsidiary tangible and intangible determinants of interest and valuation (Scoones, 2009)

These connection characteristics reflect the nature of the structure of a complex adaptive system (Cilliers, 1998) (Ostrom, 1999) in particular interconnectedness, many elements over which there is no centralised control or capacity to know everything and its openness to signals from both internal and external sources. The interrelationship between the elements or building blocks stimulates adaptiveness in a biological system and in a human centred system a mix of adaptiveness and innovative dynamics (Ostrom, 1999) (Carbonara, et al., 2010).

Dynamics

The interrelated relationship between the connection structure and overlay features and influences creates dynamics and subsequent potential for contestability. These cause and effect relationships that derive from multiple sources, including:

- Shocks and their propagation through the system;
- Incremental changes, their accumulation and propagation;
- Tensions between values, priorities and practice; and
- Intervention and innovation changing stocks of capital and applying these to activities.

The notion of dynamics counters the proposition of equilibrium as anything other than a theoretical learning construct, this has both transactional and values perspectives.

Dynamics infers both pro-active and re-active initiatives both of which stimulate creativity and innovation arising from point in time ideas, shocks and longitudinal trends and stresses at micro and macro levels. Consequently, places develop as a result of people innovating and creating from ideas, receiving and interpreting signals from many sources; creating the overt contestability of a policy issue. Change provides consequent signals that then propagate through the system; some will observe analyse and actively respond to these signals, other will sit on a continuum ranging from not observing to ignoring the signals.

The meta-framework can fulfil a number of key roles, dependent upon the manner in which it is used, including assisting in:

- Clarifying lagged connection between inputs, outputs and wider strategic outcomes, at times expressed as a change in the stock of specific capital, facilitating a futures perspective;
- Helping people understand the cause-effect linkages between the elements represented and their, at times indirect and multiples linkages;
- Highlighting that the policy "problem" is likely to redefine over time in reflection of changing values and priorities;
- Highlighting the omni-directional nature of the cause-effect and providing the basis for recursive policy design;

- Facilitating conversations and construction of multi-dimensional/perspective narratives;
- By populating the elements with quantitative and qualitative data and using "business intelligence" techniques develop a deeper understanding of the incremental and structural dynamics to support "what if" questions; and
- Understanding the mediating or limiting role of institutions, organisations and processes in strategies and development pathways and the dynamism of a place, a socio-political perspective.

Initiatives arising from these dynamics motivate contests of ideas, values and practice; the cultural characteristics that generate these contests also framing the degree to which the contests are sources of conflict or cooperation and in what balance.

Contestability

The contested perspective includes economic and social dimensions; again, the meta-framework provides a map on which potential for "contestability" can be overlayed to provide a reference point to identify the scope and intensity on the cooperation to contestability continuum from both internal and external sources.

Places compete for markets and capitals attraction; within places people and businesses compete for a share of capitals and revenue. People have differing capacities to engage, access and develop opportunity based on institutional approaches, cultural norms and traditions.

These norms and traditions and their underpinning "values" also create internal "contests" that challenge individuals and enterprises in terms of whether or how they respond to opportunity or threat.

The explicit inclusion of the cultural perspective within the meta-framework provides an additional level of insight into the characteristics, connections and dynamics of a place, in particular in what is contested or not. At a place level, diversity in values and the dichotomy of cooperation and competition, contribute to what is possible; this impacts the priority allocated to the range of outcomes sought, the measures of success and the policy options that are applied; the overlay of power and its source/application mode is inherent in this, manifesting in both political terms and agency.

Case Study Analysis

Each of the themes and cases utilise a meta-framework to represent multiple perspectives, dimensions and connections as described in Chapter Three. The nature of the activities within a place is described as a value chain of determinant activities and makes the connection between community capitals applied to those activities to generate economic and social outputs and outcomes,

The lagged consequence supports cause/effect analysis, for example, how a change recognised or initiated in one element propagates directly and indirectly through the system – a predictive capability – "if this happens, or we do this". In addition, how a desired change to the condition of objectives can be achieved through catalytic changes in elements of the value chain driven by development of community capitals and their activation – "if we want to achieve this, what do we need to do".

The following identifies the manner in which the factors associated with "connected, dynamic and contested" are addressed in the cases using the meta-framework and associated tools to contribute to framing a policy/strategy mix that positively influences the future, improves livelihoods and quality of life.

Theme One: Place-based futures

Chapter four includes 4 place-based Tasmanian case studies:

- The Northern Tasmanian Settlement Strategy;
- The Derwent Valley STEP (Social, Tourism & Economic Plan);
- The Coal Valley Tourism and Bio-Economy Zone Strategic Development Framework; and
- The Launceston Cities Deal.

Each of them spans the boundaries of local government areas, with the Northern Tasmanian Development Strategy and the Launceston City Deal involving other levels of government in policy/program implementation and investment.

Connected

The meta-frameworks within the cases represent the regional and dissembled forms of the meta-framework to analyse, explain and demonstrate the strategic options for the places and their conjoint development pathways. These options and conclusions are premised on the potential contribution of the sectors identified in the value chain, the intervention mix and their relative importance and priority in achieving defined multi-perspective outcomes. The meta-frameworks flexibility of application to specific places is demonstrated in their definition of the strategic objectives and intent. This intent drives its future orientation, influencing the critical technical and social connections and the focus of the activity profile and the capital interventions that are the critical formative elements to frame the propensity to act, with what.

Activation requires the application of a combination of community capitals, access to further investment to build and utilisation of contemporary capital stock. This activation is also premised on social fabric that has the motivation, authority and willingness to use this capital or elements of it; factors that introduce the role of power and politics in determining the linkages and weighting of the application of capitals to practice. The cases demonstrate the role of the meta-framework in determining what can contribute to this preferred future, how it will be activated and the necessary complementary governance structures.

Within the Northern Tasmanian Settlement Strategy this concept of understanding the contribution of a sector or activity to regional outcomes led to the development of a "role of settlements" taxonomy. This taxonomy described the primary value that individual or key parts of the urban environment contribute to the region, their complementarity and connections. These contributions ranged from amenity centres through to economic engines, providing a multi-perspective socio-economic construct upon which to determine interventions as the basis for policy development and their benefit and costs. This categorisation created an outward looking perspective, generating a "market value and contribution to people and place" proposition on which to develop settlement policy positions that reinforced their value and provided a positive response to other strategic scenarios that impacted them and the region. These scenarios formed the basis on which to consider "shocks" to other sectors and their impact on settlement; including potentially altering their role within the region. This approach challenged the traditional "land zoning regulation" characteristics that typify consideration of settlement policy in preference for "role and contribution" as the primary determinant.

The Derwent Valley example demonstrates how the meta-framework for the place as a whole can be decomposed and dissembled to develop subsidiary economic sector (primary industry and tourism activity) representations, nested under the broader place-based representation and consistent with the place outcomes and impact objectives that reflect product/service connections and the connections to external markets.

The fundamental resilience factor of education and present – future connection was the focus within the specific youth development strategy. This decomposition included substitution of the sectors value chain with a progressive profile of the socio-economic determinants of "low education attainment" as the focus for application of capital interventions.

This decomposition and dissembling created a very practical focus for working groups, utilising language and process people are highly familiar with in a systems context framed by common objectives but with differing sectoral contributions to them; facilitating re-assembling into a specific sector context. In each example, the "development pathways" provided the explicit connection between the community capitals and the activities/determinants to activate the strategy. The link between these decomposed sector frameworks with the broader place-based strategy is evident within the strategic dimension and its consolidated activity and capitals elements. This re-assembling supports the Hoppe (Hoppe, 2018), binding the dissembled element to the whole system requirement to consider how each sector and

changes in educational attainment propagates through the place and occur within a structured, multi-perspective governance and management mechanism.

The Coal Valley and Launceston City Deal cases reflect a stronger, structured connection to state, national and international policy settings and initiatives as a key influence on the strategies.

Primary industry and tourism are key activities within the Coal Valley; analysis of structural and formative factors based on the multi-perspective construct of the meta-framework highlights that the sectors are relatively disconnected. Primary industry provides examples of some enterprises that are highly connected to external markets, but large areas of land with access to irrigation retain traditional dry-land farming practices. Tourism policy is driven by visitor numbers and success measured largely by increasing visitation.

The meta-framework outcome categories highlight the importance in complementing economic output/revenue with economic productivity measures. This differentiation ensured focus on evaluation of productivity highlighting low "conversion" of tourism numbers to revenue and profit; low conversion of dry land to irrigation, higher productivity; and to next level value-add in both sectors. The inclusion of a specific cultural element within the meta-framework, identified tradition and established practice as a mediator to altering production and productivity. The cultural factors limiting innovation and sustainable productivity because of perceived "trade-off" to established patterns of livelihoods and quality of life. The relatively low conversion result was identified as being linked to the stock of capitals available.

In recognition of the socio-technical mix, the primary industry conversion theme was signalled through "Bio-economy" theme that reflected:

- New ways of approaching agricultural production;
- the challenge of increasing farming intensity to adjacent estuarine aquaculture;
- part of an already commenced evolution for some; and
- a signal to others of alternatives to tradition.

The repositioning was also designed to attract institutional support to the place as a pilot and as a contributor to the State Government's Tourism and Primary Industry growth strategies and their integration in place. This demonstrates a wider connection between "big shifts" in OECD and Tasmanian Government Policy and on-ground practice. The strategy/proactive dichotomy was reflected within the interconnected governance structure reflective of both the sectors and the strategic intent and connections.

The Launceston City Deal presented as a systems logic meta-framework provides a representation of the connection of its strategic themes, which in combination can contribute to the program's goals of productive, liveable cities. While listed, the connections between the City Deal themes are not readily apparent in text forms; the meta-framework providing an alternative to "checklists" as a means of providing a policy narrative. Comparative analysis between the City Deal program structure and the regional development meta-framework highlights continuance of the dominance of built capital as the primary intervention tool in

regions by its relatively narrow focus compared to options available. This highlighting the potential for complementary investment in other activities and capitals to build on the impetus of the City Deal. The dominance of infrastructure spending by government, to the exclusion of, or assumed precursor to, other forms of intangible capital development becomes apparent when adopting the meta-framework approach that highlights the option to invest in a mix of community capitals as a portfolio bundle to reflect the specific place context.

The meta-framework demonstrated usefulness in identifying and representing key socio-technical connections and by providing a mechanism for identifying and understanding where endogenous and exogenous stresses and shocks impact directly and then propagate through the system. This supports understanding of the nature and importance of the connections, including the macro-micro connection challenge. The socio-technical perspectives were highlighted in the structure and associated measures, in combination with the inclusion of cultural perspectives helps ensure the policy and strategy initiatives are not naïve, a claim posed in relation to the livelihoods approach. This is further mitigated by inclusion of cross discipline and community engagement as part of this connecting process.

The case studies and their meta-framework foundations indicate the importance of the connection between strategic and operational dimensions and their bi-directional relationship; understanding how a place works and why, the reflection that occurs through careful consideration of outcome alternates and the recursive design of capital to activity interventions that are enabled by the attendant culture. Mapping within the meta-framework structure is the foundation, the manner in which it is used to understand the dynamics of what is represented transforms it from a static representation.

Dynamic

These cases are development strategies, a motivation to move to a "better condition", across defined ecological, economic and social perspectives as outcomes and the attendant characteristics of the sectors. The connections framed change the dynamics within and between the sectors and community capitals through governance, management, market and community relationships and focus.

In each case, the characteristics of the places have developed over generations. Significant private investment has been attracted based on natural capitals, relatively cheap energy and public investment, largely to power generation and distribution, transport, and social infrastructure in areas such as education and health and over more recent periods to irrigation and the digital broadband network. In the Derwent Valley context, the public health facility has closed, energy infrastructure construction has experienced several cycles of investment, followed by a "lull" and as with Northern Tasmania, manufacturing located on natural resources and/or low-cost energy is under constant pressure from global competition. The dynamics associated with this pattern tends to reflect steps or cycles of rapid escalation and subsequent decline; the synchronicity between shocks and stresses in the sectors either dampening or escalating impact on the structure of place and how it works. This focus and pattern have two major impacts:

- A perception that capital is primarily repented as infrastructure or resultant physical /service production and the balance of capitals as characterised in the Emery construct are ignored or attributed less value as a complement or end in themselves; and
- It is the stock and flow measures of these narrowly defined capitals and outputs that form the bundle of signals that elected and public officials utilise to make decisions.

In this context signals are interpreted in highly bounded constructs. Once capital is received, evaluation of its benefit or further catalytic potential rarely occurs in a place context; new problems are attached to a new need of physical capital or more people, a stance reflective of the "problem solving" stance identified in Chapter Two.

Arguably this mode is a learned response, a specific cultural and behavioural nexus supported by political and governance institutions, structures and processes. The dynamic meta-framework approach provides an alternative to this traditional mode of gathering and utilising information; a complementary, incrementally managed model utilising multiple capital interventions with varying priorities and weightings that are context dependent, in essence combining evolutionary and shocks.

This alternative requires a systemic and dynamic information sets to populate the meta-framework as a means of enhancing understanding, supporting decision making and evaluation. These cases were progressed in environments that traditionally do not utilise information in a structured, systemic manner. The City Deal, while identifying typical measures associated with its scoped intervention mix and the outcomes sought, similarly does not structure these within any systemic, structured dynamic framework.

This imbalance is demonstrated in the resultant challenge of providing broader benefit-cost analysis which meaningfully evaluates social benefit and in evaluation of the actual benefits accruing from the investment. Clarification of outcomes within the meta-framework is designed to support enhanced understanding of the flow of benefits as the impact of investment propagates through the system incrementally

The meta-framework and its multi-perspective and multi-dimensional structure provides an information architecture for the organisation of signals that identify changes to the elements and "a picture of the system and its relative dynamics". It provides a scope and time dimension reflective of the context; however, the cases identify that there is rarely a receiving and responding system for the information set, without complementary organisation development interventions.

Contestability

As development strategies, the case studies are based on the Pareto principle of "making no-one worse off, while making some better off", again, on the surface a simple concept which in practice is highly values dependent. Consequently, while the strategic intent and technical perspectives within the cases are not significantly contested and the narrative established by the outcomes establishes significant common purpose; the initiatives and weightings that are

reflected in the mix of capitals applied in development pathways exhibit varied levels of contestability. The focus on education within the Derwent Valley case while adopted by the development management group faced cultural challenges within specific community segments, the term "Bio-economy" received some resistance; highlighting the potential for language to be both "off-putting" and also for agents to use language or terms to divert from the intent.

Stakeholders associated with production and service enterprises participating in the cases have tended to readily accept and utilise the representation as a mechanism to help make sense of their environment and to get all of the issues on the table. The development of clear outcomes and multiple parameters has helped them identify new options and re-prioritise initiatives and actions.

Within place-based development, where key actors and agents are often government or sector association employees, the meta-framework introduces a transition from traditional approaches and potentially lies outside normal practice in terms of its architecture, logic and processes and also in resultant parameters and resultant conclusions that challenge prior expectations. This has consequences for "the view of the world" and those who have traditionally framed it for policy and strategy consumption.

The implementation of the meta-framework derived policy/strategy is highly dependent on actors being aligned to the thinking model and its dynamic system logic. This provides an indicator of the importance of the governance elements within the meta-framework and the cultural overlay to this, including the motivation to "do things differently". This cultural perspective can create a significant internal contest not in endorsing the strategy, but primarily in activating with structure and vigour.

Contestability is not always overt, it manifests in analysis of participation, achievement, production and productivity data, reinforced through social research; inclusion of the cultural perspective within the meta-framework assists to identify specific place contexts and factors for consideration:

- Within the Derwent Valley a large-scale timber, paper manufacturing and a mental health institution had created an intergenerational dependence on employment that had relatively low educational requirements; and
- An inwards focus on the place and lack of engagement with the wider world.

Common to both the Derwent and Coal Valleys was the retention of traditional dry-land, relatively low productivity models of farming, peppered with higher value operations based on the use of irrigation. The transformation to higher intensity, higher value operations at times less influenced by economics than desire to maintain a traditional life-style.

From an implementation perspective, a practical application of capitals is manifested in the inclusion of specific governance, management, participation and practice development models. These combine people with place, to generate focus and practice dimensions that

recognise and reflect these socio-technical perspectives, in a manner designed to create a greater probability of success than traditional specialist or silo structures.

Theme Two; Industry in place – common pool resource utilisation

The emergence of the concept of social license as a challenge or complement to public policy is changing the certainty profile of industry and enterprise establishment and continuity. This is a function of the characteristics of place, people and their culture, values and behavioural dynamics. Dependent upon the nature of the industry, the locational definition of place may alter in response to the system overlay dynamics.

The commercial export abalone industry has operated in Tasmania for over 50 years. During this time it has transitioned from:

- a start-up phase enabled by young divers, with a sense of opportunity and adventure exploiting a newly identified export opportunity;
- through an industry maturation phase where it became an investment opportunity for the wider market, with a separation between the catch and processing stakeholders and the owners of the resource capture rights; and
- is now on a potential trajectory where rather than the stock and flow of abalone being the "end game", the sustainability of the rocky reef system takes pre-eminence, policy and practice related to the stock and flow of abalone fitting within this broader within this context.

The consistent theme through these phases is the management of state-owned, common pool resources within differing but progressive contexts.

The manner in which the system addresses the management of state owned, common pool natural resources is a consistent them through the phases.

Connected

The progressive versions of the meta-framework highlight that the contextual connections that represent the industry, how they are defined as a system, their relative importance based on exogenous and endogenous influences and how they change over time and in response to circumstances.

The initiation phase exhibits connections associated with the "closed shop" of abalone divers, processors and government, as a consequence, the limited scope connections across the meta and meso dimensions are defined in this context. Somewhat unstructured, the activities within the value chain reflect the basic production process and the intervention mix the capitals associated with the players and in particular the establishment of a regulatory response to the industry. This period initiated and developed over a 20-30 - year time frame during which the industry experienced:

- Significant, cyclical and trend depletion of resources arising from catch management, and climatic events;
- Separation of rights to capture the resource from the catcher to investors;

- Integration of the policy stance to included broader resource development and environmental management and multi-species and habitat sustainability.

These primary factors changed the system and by the mid 1990s, the industry transforming from being relatively unstructured to highly structured in both regulatory and commercial mechanisms. The meta and meso dimensions within the Phase Two meta-framework change to reflect this mature, investment and policy positioning within the industry. The strategic changes flow through to the micro-dimension reflected in the value chain and intervention mix, stance and weightings to represent sector operations and culture.

The connections are now increasingly intense, it combines people directly involved in harvesting and processing, agents and other interests reflecting the expansion of connections since the initiation phase; the focus on managing stock and flow of the natural resource, with a profit optimising focus.

The industry has adopted government policy and regulation as the proxy for wider community and societal values of the relationship between the benefits and costs of harvesting, leaving the government to address the share of the resource between commercial and recreational interests and the understanding of the relationship between abalone stock and the sustainability of the rocky reef system as a whole.

The inclusion and analysis of the multiple perspectives within the meta-framework that complement the traditional resource management science and management structures enables emerging social issues and wider societal and global issues and trends to be included. This assists in enhancing the mix of issues and the potential to identify emerging signal and mediate industry responses. The identified emerging phase is a function of wider and longer terms trends and stresses, over the past 20 years a number of influences have emerged which have particular. Potential impact on the industry, including:

- Emergence of a viral risk to fish stock;
- An increase in water temperatures and changes to the bio-logical profile of much of the rocky reef system
- Emergence of social license and global perspectives to the ecological, economic and social context.

Given these changes, the "system" its focus and its connections and influences would be reconfigured. The meta-framework highlights the policy problem redefining over time with changes in values and priorities (Hoppe, 2018) and with this is changes to scope and for some the definition of factors and measures within the elements.

The prior focus on abalone in relative isolation transforms to one of considering abalone in the context of a sustainable rocky reef system. This interest and its local, place-based manifestations introduces a much broader range of stakeholders and factors as represented in the "Industry in Place" positioning, one in which abalone takes and important but subsidiary position relative to that of the initiation and maturity, where the connections, dynamics and contestability was arguably contained to those with a direct commercial and stewardship

interest. The containment of perspectives included by the industry, compared with a place focused meta-framework, increases the risk of signals not being received from other latent or emerging connections, interests and potential influences until they become a direct and significant threat to which industry responds defensively, at times unnecessarily diminishing its position and options.

Dynamic

The nature of three phases represented in the meta-frameworks, the first two being reflective representations of the phases superimposed on the meta-framework model and the third a potential provides an indication of how endogenous and exogenous ecological, economic and social connections and the dynamics were recognised and or managed.

The change in the system behaviour arising from the ability to sell licenses, disengaging the license form the requirement to catch generates a structural change to the industry reflected in the maturity phase; the inclusion of sustainable marine ecosystems provides a signal that the industry is now connected to broader concepts of eco-system sustainability as underpins the Phase Three meta-framework and social license concepts. These behavioural changes create major changes to the dynamics of the industry, transforming from a narrow overlay of influencings, to a wider set reflective of an increasingly widely capitalised industry and subsequently and Phase Three to one which includes national, multi-perspective interests associated with being a component of a wider Southern Reef System and its potential.

Industry consideration of changes in community culture and signals from other natural resource sectors would lead to re-definition and re-weighting of the elements within the system that integrate the consideration of the connection, what it might mean and the dynamics of its propagation through the system.

The three-phase representation of the abalone industry demonstrates the utility of the meta-framework approach is helping represent, explain and understand the dynamics both within a period and to also help recognise the redefinition of the problem as articulated in the vision. The redefinition impacting the system such that it transforms to "a new dynamic system" as represented in the phase three meta-framework.

This is analogous, but much broader in perspective to the utilisation of panel data techniques in econometric analysis, where interdependencies within and between periods are determined, providing both explanation and predictive capacity. The importance of gathering and productively utilising information that represents the industry and its "in place" dimensions to achieve a within and between period understanding of influencing connections can be a key advantage in adapting to fit and achieve resilience. The abalone industry trajectory appears to represent a continuation of its maturity life-cycle phase and internal focus.

Contestable

The contestability core of this case is in considering a transformation from considering the abalone as the common pool resource to one which considers the Southern Reef System of

the common pool resource. Within this focus, the abalone industry is considered as a sub-system along with other "resources" that exist within the reef system; re-framing the connections, dynamics and contests.

Comparative analysis of the three meta-frameworks highlights the emergence of an increasing range of contests related to the utilisation of the resource and from this the interests and values to be co-managed with the stock and flow of abalone resources. The three phase approach adopted in this case study highlights the potential for both those who govern places and industries to fail to perceive or respond to contests that are emerging

As identified above, the use of the model to identify emerging and potential dynamics, including their impact on the strategic positioning of the industry is designed to redefine and innovate that positioning, the value chain and the product to mitigate the critical contestabilities.

An example is the ability of the industry to roam the whole of the abalone eco-system as of right, compared with an option to intensively manage a specific, highly naturally productive zone by the industry investing in a mix of breeding and re-seeding and allocated, lower cost per unit harvest; on the basis that other zones are best left or subject to light catching. The market may (or not) reward such an environmentally managed, while remaining "wild caught"; a three-way contest between the industry and their market and others that seek to capture the Tasmanian abalone market position.

This example provides a mix of contestable arenas captured in the use of the meta-framework, for example:

- The sustainability of stock, harvest and natural recruitment;
- The efficiency and viability of harvest compared with catch levels and price;
- Commercial use of abalone compared with sustainable reef eco-system and future resource utilisation of other reef resources;
- The relationship between commercial viability and ecological management and sustainability;
- The return to the Tasmanian public and its natural resource management compared with the viability of the commercial industry; and
- The context of social license as an evidence based ecological, economic and social construct.

Theme Three: Macro-policy and place-based potential

The challenge of linking and applying macro policy and issues into relevance and practice at the at smaller scales is recognised. The place-based approaches recognise the importance of building on endogenous strengths and opportunities, this case attempts to integrate these two perspectives to both create local place-based value and enable smaller, regional populations to participate in the "new economy".

This case focused on three key perspectives:

- The identification and potential utilisation of latent resources within a place to create new and more productive community capital;
- The development of new and disruption of existing value chains to support this potential; and
- Macro to micro linkages demonstrated through the translation of national policy agenda to place as part of endogenous opportunity realisation.

It differs from the previous cases in that:

- It draws on a latent, unexploited endogenous strength, one often perceived as potentially low value community capital and source of capital flow; and
- It aims to codesign an integration of macro policy with micro activity and practice.

Connected

Within the meta-framework, the macro to micro supply side connection occurs by:

- Defining the outcomes at the meso dimension in terms that reflect both macro and place terms, bridging the connection between the two dimensions explicit;
- Focusing the capital descriptors on the skills and capability characteristics and the institutional and social capital utilised as interventions; and
- The design of extension and disruption to the value chain.

These connections are further clarified, and their interdependency defined in the development pathways.

The demand side, the market/product mix is designed to achieve commercial viability from the investment in capital development connection occurs at the "right hand" end of the value chain.

The tangible/intangible connection occurs through the descriptors within both value chain and capital interventions, this moves the intangible into the foreground within heritage policy and strategy, in particular the formative capitals and their application to activities that form the value chain.

The importance of the cultural perspective in highlighting the potential value, reconciling its commercialisation (or not) and then being open to capitals development to the extent that the product/market innovation occurs is connected through the mediation "filter". The meta-framework, by consolidating the issues, enables a "system" co-design approach and the prioritisation and weighting of capital intervention to productively achieve and sustain a positive program wide benefit-cost and enterprise return on investment.

Dynamic

The meta-framework drives and supports the extension and disruption of the traditional heritage tourism value chain introduces a new dynamic; itself facilitating further change as new signals are received. This recognises that signals from outside the traditional tangible

heritage meta-framework have initiated these, through the "what if" query to design alternate approaches.

In a manner reflected in traditional multiplier approaches, the introduction of new knowledge and capabilities and demonstration of its application in practice potentially introduces a new dynamic to place and its flow-on by transfer to traditional activity and generating additional activity.

Contestable

The case identifies the potential for both overt and less transparent cultural value contests, for example people merely not engaging because of a tension between proposal and values or clearly identifying perceived inappropriateness of including specific cultural elements.

The meta-framework and its supplementary tools were designed to create a framework for design and consideration of these challenges at program, place and practice levels. The contribution of the value chain activities to the outcomes sought and the subsequent connection between the development of capitals to enable this performance and productivity in the value chain supports a contextually relevant socio-technical approach to co-design, implementation and evaluation. This enables a managed approach to addressing and leveraging value from contestability based on bringing together, engaging and considering multiple perspectives within a contextual meta-framework representation.

General Application

The above discussion addresses features of the application of the meta-framework to the "connected, dynamic and contested" nature of places and public policy/strategy arenas through specific themes and cases. Analysis indicates that the three factors provide both opportunity and challenges to policy making.

The policy analysis and policy making features identified in the introduction of this chapter are ubiquitous in public policy.

Analysis indicates that the meta-framework and its associated tools can be used to make a contribution place development policy. The following considers the appropriateness of the logic architecture, content and use frame as the basis for considering the dynamic systems logic meta-framework in general application.

The two dimensions of the meta-framework are based on:

- Program logic as the vertical axis, introducing the input, outcome, impact two way lead/lag progression (micro, meso, macro and meta dimensions) and from this time; and
- The triple bottom line based on ecological, economic and social perspectives as the horizontal axis introduced the notion of multiple perspectives across these dimensions.

These can be generally applied. The meta-framework can be assembled, dissembled and reassembled (Ostrom, 1999) to reflect policy contexts as a binding system (Hoppe, 2018)in a

general sense. The strategic dimension can be defined in specific ecological, social or economic outcomes, or sub-sets within a particular arena. The activity profile can reflect a wide variety of contexts and, as identified earlier in the thesis alternated with determinants, such as those derived from SEIFA categories or particular health determinants etc. The consideration of inputs as utilisation of a stock or further development/recruitment of capitals are widely applicable.

Assembling the meta-framework has two distinct starting points, expressed as questions:

- What are our goals; and
- What is happening on the ground?

While both dimensions will be addressed during the design of the meta-framework, project participants have responded positively to the assembling of the meta-framework dimension by dimension until the system as a whole is derived.

If the approach is focused on identifying/achieving goals, this is dimension is firstly mapped; if it is an operational problem, then the practice dimension is firstly mapped as the basis on which discussion of the system representation and process inititiation. This enables the representation, understanding and explanation of complexity to evolve, moving from the initial interest and known to the unknown through a process of discovery.

The cases indicate a flexibility of application, utilising a structured meta-framework to define the elements to reflect context. The activities that create the product/service outputs have been categorised as a value chain in place-based and sector development projects because of the adoption of the principle of each step adding value to the next, rather than necessarily reflecting a defined process. Importantly, and as included in the youth development case, this "line" can be reconfigured to reflect "social determinants" associated with specific social outcomes such as education, health and crime; moving them from a list to a set of progressive and interdependent elements within a "system".

The representation, explanation, design and evaluation advantages of the meta-framework to bring socio-technical dimensions and multiple perspectives together flow into more general application than reflected in this thesis.

CHAPTER EIGHT - CONCLUSIONS

Introduction

Heuristics are important (Hoppe, 2018). In both formal and informal forms, they guide personal, organisational and political decision making. In some instances, they are transparent and explicit, in other instances opaque and implicit - a learned or traditional response to issues. This research and the associated case studies demonstrate how CAS characteristics can be transformed into a structured heuristic in the form of a dynamic systems meta-framework to support the development of policy and strategy with a particular focus on place and people.

The motivation for this research was achievement of improved alignment between policy and strategy development approaches and "real world patterns of interconnectedness, dynamics and contestability" compared with traditional linear, reductionist models that have traditionally dominated the field. Without such an alignment of thinking, process and decision making to reality, policy making is analogous to "shooting in the dark".

Dynamics and multiple perspectives have been long recognised as real-world challenges that are not necessarily represented in policy and strategy development or in underpinning economic and other forms of analysis. Parallels between the manner in which people interact within places and natural ecosystems operation, adaptability and evolution have been drawn; leading to consideration of the potential for complex adaptive systems (CAS) thinking to be applied to the policy arena.

While an attractive proposition, the challenge to its realisation has been in how CAS characteristics can be usefully framed and utilised in policy making. This approach to transformation of these characteristics to a realistic meta-framework assists in representing, discovering, understanding, explaining the technical and social connections, dynamics and contestability that exists within and between places to help develop policy and strategy that better reflects the "real world".

This research and the case studies demonstrate how CAS characteristics can be applied to a realistic policy research and practice meta-framework and how a range of complexity thinking, and engagement models can be integrated into a meta-framework to increase their value. The utility and implications of the dynamic systems meta-framework approach are considered within three key themes:

1. Complexity thinking and engagement models;
2. Policy Practitioners; and
3. Policy Researchers

These lead into conclusions relating to how complexity is approached as a policy potential.

Utility and Implications

Complexity Thinking and Engagement Models

Socio-technical Systems

Socio-technical constructs are widely utilised as a basis for analysis, design and management of organisation and community initiatives. The meta-framework enables the combination of technical and social perspectives through the scope of content, associated measures and the application of overlays that reflect specific cultural and behavioural perspectives.

The collaborative processes used to identify contextual scope, assemble and apply the approach enable the introduction of lay, specialist and technical input into a meta-framework that enables discourse, analysis and decision making with appropriate weighting in response to input/evidence source and veracity.

The implication is that technical or social policy initiatives can be moderated in response to each other as a result of bring the social dimensions equally to the forefront in representation and in developing understanding.

A specific challenge in the introduction of the social perspective, in particular within behavioural aspects, is the likelihood of the evidence occurring in "observational form" that is general, rather than modelled, albeit at times modelled, using simplified relationships.

Community Capitals

Community capitals are a means to identify the diversity and capacity of resources available to or necessary for a community to perform in the short-run and on which to base longer run success. The meta-framework architecture highlights community capitals and brings them to the foreground as formative and resilience factors and potential policy initiative arenas.

Capital measures provide an indication of capital stock able to be invested in policy initiatives and as outcome targets arising from investment to achieve direct change in outputs and flow-on outcomes. Importantly the meta-framework highlights the diversity and strength of capitals available to a place. This enables expansion of the scope of policy initiatives beyond traditional investment in tangible assets to include innovative and balanced mixes of capitals intervention that are designed to create increased policy value.

This reinforces the key, general role of policy in creating and applying community capital to facilitate sustainable livelihoods and quality of life. While expressed within the meta-framework as stock and flow inputs, the profile reflects the range of available resources that can be used singularly or in various combinations and weights. Consideration of current policy flow patterns can highlight potential over-use or under-use of existing and externally available stocks.

Program Logic

Program logic is an essentially linear cause/effect progression and although highly utilised and valuable, it does not easily integrate multiple perspectives. The principles and logic flow of "Program Logic" form the vertical axis of the meta-framework. As demonstrated in its wide and long-term application it provides important structure to the meta-framework, enabling the bi-directional connection between the short-term and long-term dimensions.

Critically the logic enables both "top down" and "bottom up" analytical and activation flows and associated cause/effect considerations. This capacity addresses the critical macro-micro connections within place-based development, short to longer term consequences and the practice to politics recursions identified as central to policy making.

The Triple Bottom Line

The triple bottom line is an articulation of the benefits of adopting multiple perspectives to policy and strategy design. The meta-framework utilises this principle across its whole form. Within the place-based case studies it repositions to environmental, economic and social perspectives to a "strategic intent", rather than a "bottom line" positioning that arguably infers them as a consequence.

The integration of the triple bottom line into the place-based model is a reflection of the principle of including multiple perspectives at each dimension as characterised within program logic. This is consistent with the dissembling principle, it considers place from environmental, economic and social perspectives. The meta-framework dissembles the economic perspective into two parts – economic performance and economic productivity to enable consideration of factors such as volunteer engagement.

While the triple bottom line derivation is applied in the case studies, other policy arenas may be most heavily skewed, for example to social perspectives. In this instance a range of important, complementary social perspectives may be critical by contributing to some longer term end-point.

It is the formulation, definition and understanding of the range of complementary outcomes and the inherent range of perspectives that is necessary to generate conversation and explanatory narrative around what is to be achieved within the policy arena. Arguably the outcome dimension provides greater potential for agreement between contested interests than is at times able to be achieved at the policy/practice dimension.

The meta-framework enables multiple perspectives across all dimensions. At the micro dimension this facilitates the inclusion of the scope of sectors that exist within a place, or in specific arenas such as social policy, the range of determinants associated with particular conditions. As identified above, at the policy intervention or inputs dimension, this supports inclusion of the mix of capitals available to exploit or further develop. The two-dimensional architecture enables omni-directional relationships and interdependencies to be identified and exploited.

The multiple perspectives are important to reducing the "binary" or reductionist nature of policy conversations and the inclusion of wider professional and societal participation.

The Balanced Scorecard

The Balanced Scorecard is compatible with the multiple perspective principles of The Triple Bottom Line. In particular the strategy map form introduces the application of lead and lag measures within a business intelligence model.

The principles introduce the application of business intelligence (BI) as tool into policy making to support "learning your way" to better policy outcomes by supporting an adaptive, recursive approach to implementation. The BI structures can also rapidly capture the impact of externalities.

The meta-framework provides the architecture for a BI system. This can complement more traditional statistical and econometric techniques but importantly enables consideration of techniques that fit under the ambit of "artificial intelligence".

This potential capacity arguably challenges the way policy is considered, approached and applied. It supports the concept of policy as an experiment and technically it may diminish the importance of pursuing certainty. The cultural limits to this goal are likely to be significant; it may be politically untenable, professionally challenging and require a general level of analytical and discourse maturity that is currently under-developed.

Livelihoods

The meta-framework provides a representation of the critical elements and building blocks of livelihoods identified as preferred by the participants in its design and assemblage. The structure and overlays address criticisms of the approach.

The capacity to dissemble and address in a reductionist manner assists to address the challenge of complexity; as discussed above political dimensions are considered and exogenous factors are both identified and their propagation through the system able to be analysed.

Policy development is complex, arguable increasingly so. To develop policy within an umbrella concept such as "livelihoods" requires an approach that reflects and addresses such complexity; to not attempt to do so is an abrogation of both political and governance responsibility.

Complexity Economics

As a key characteristic of complexity economics, the meta-framework brings the outcomes dimension and formative factors of an economy (and society) to the forefront. This balances the traditional focus on outputs as the dominant economic measures of success and progress.

This enables transaction/output relationships to be juxta positioned with broader concepts of progress and resilience based on the previously mentioned stocks and flows of capitals and multiple perspectives.

Inherent in this is the capacity of the meta-framework approach to frame the interdependence of environmental, economic and social perspectives and condition, interdependencies ignored within traditional economic commentary, in particular at the macro or state level.

The associated broadening of the scope of economic analysis, aligned with complexity economics, is supported by the meta-framework architecture and its foundation for BI and artificial intelligence discussed above.

Social License to Operate

The emergence of social license to operate indicates failure of policy and legislation at the community (of interest) level. The combination of the meta-framework, its associated tools and the collaborative processes are designed to achieve a community mandate in relation to policy.

This highlights the importance of both a heuristic and practical, realistic meta-framework in achieving the transition from authoritative policy structures and mechanisms to more participative and broadly mandated models. The discourse able to be framed creates a purposeful narrative, while enabling contradictions and contests to be identified in parallel.

Practitioners

Policy practitioners are constantly under pressure to provide answers, in some instances the simple solution for a complex "problem". This demand is hard to resist when the policy arena lacks a heuristic and arguably a practical, realistic meta-framework to place matters arising into a systemic context such as provided by the meta-framework.

Importantly, the meta-framework provides a structure that enables the "issue" to be lifted up to a level above practice and outputs to begin a process based on the "purpose" for intervening.

New regional development and policy concepts, approaches and tools constantly emerge. Depending on marketing some tend to emerge and rapidly disappear, others are more durable. The meta-framework and associated case studies have demonstrated that it is important to place these tools into a context to create value from them.

Similarly, the meta-framework provides a means of systemically addressing "gaps, shocks and emerging issues" in a manner that places them in context, allowing the structured analysis and development of subsequent narrative.

Researchers

This research barely scratches the surface in relation to developing and using multi-dimensional and multi-perspective frameworks as represented in the meta-framework and associated tolls and processes.

The research and case studies indicate that it does provide value and provides a basis for practically integrating multiple perspectives. Detailed research into the compatibility of systemic integration of diverse theoretical and analytical frames will further test the potential.

Inherent in this research is how we "think about complexity, in a binary sense is it a problem or opportunity.

How we think about complexity

The meta-framework assists in considering complexity as a policy opportunity rather than a policy threat. Complexity provides opportunities; understanding complexity and discovering socio-technical relationships provides opportunity to add further and create new value. This emerges as a "choice, decision, consequence" disruption:

- Increased choices;
- Decisions that reflect cause/effect across multiple time dimensions and the integration of multiple, identifiably relevant perspectives and relative weightings; and
- Consequences that create broader contextual and identifiable value.

Complexity attains the position of ally in addressing real world policy issues; thinking in complex frames allows specific issues to be excised, addressed in a reductionist form and then re-inserted into the system to assess the propagation effect of proposed changes as a test for efficacy, additional benefit or unforeseen circumstances; a capability less able to be achieved if commencing from a reductionist position. This opportunity is a function of how complexity and context are framed.

Framing and representing complexity

Diagrams are an effective form of communicating static and dynamic relationships between objects. The meta-framework provides a mechanism to transition from the concepts of a CAS to a diagrammatic, data management representation and communication device which can be used to transform the characteristics of a CAS to a usable public policy construct and a mechanism within which to productively utilise of the CAS and other dynamic systems concepts.

The meta-framework architecture provides an effective means of mapping and framing the features that determine place complexity; multiple socio-technical perspectives, collective and individual capitals, values, interest and lead/lag relationships, or in terms "chaos". It achieves this by creating a vertical axis that provides the micro to macro progression and a horizontal axis that provides for inclusion of multiple perspectives in each of these dimensions. The overlays to this technical map support integration of the cultural dimensions and other factors that influence how elements are framed, signals are received and responded to and importantly the clarifies propensity for change – what is possible within the system.

A central theme within the CAS concept and the meta-framework representation of mapping the structure is the sourcing, propagation and receipt of signals that motivate change and

adaption. The convergence of these signals with receipt; interpretation and subsequent willingness and capacity to act is at the core of the public policy challenge at all levels of government. The meta-framework recognises and contributes a mechanism to more effectively address this challenge through the explicit recognition of culture, the propensity and potential for change and the inclusion of the subsequently available community capitals as both a stock and key input into development and resilience.

"Community capital" infers the authority and capacity of the community and/or its agents to utilise, develop and regenerate the capital and to decide where it is applied and for what benefit to whom. The meta-framework supports analysis of the stock, development and flow of capitals and their subsequent application to activity to change outputs. The manner in which this application occurs, and its beneficial focus is cultural; a function of the values, authority, power and influence and traditions that frame the manner in which the societal system operates and changes, or not. This identifies the role of the meta-framework in bringing important formative and outcome factors into the fore-ground (Arthur, 2014) (Hoppe, 2018) and develop balance in the determination of societal progress that goes beyond output focused economic measures.

The meta-framework representation, based on this architecture, supports the following.

Understanding and explaining complexity

The meta-framework architecture enables consolidation and consideration a contextually specific and important mix dimensions and socio-technical perspectives, framed in the manner proposed in this research, it provides a mechanism to help understand and explain complexity.

Consolidating these system elements on a page within a "systems logic" construct creates a frame to widen the diversity of perspectives included. This enables associated lay and professional inputs and supports people to consider the current state of a policy problem, it's causes, to map the immediate and flow-on effects and help to subsequently identify the mix and weighting of interventions that will contribute to achieving a preferred condition.

The cultural overlay is designed to ensure that power, political and value factors are included in the analysis to ensure understanding is based on a socio-technical frame. Including the macro/meso, strategic dimension as the achievement sought, assists in understanding and explaining the wider range of perspectives that contribute to that achievement and consequently should be included in the conversation and initiatives. The resultant discovery, understanding and explanation derived from both lay and professional input, exploration and explanation combining to create the policy practice dimension and narrative.

The consideration of current and target condition across the perspectives and linkages that populate the *contribution table* creates a bridge between the strategic and practice dimensions by clarifying the contribution of each element of the activity value chain or determinants to the outcomes sought. This analysis allows for negative and positive impact of the output/service characteristics of the activities or determinants to be identified; and further

consideration of why the micro element reflects those characteristics and the relative contribution of the elements.

The application of the framework as an information management construct allows a relevant, complete quantitative and qualitative data set to be presented, combined and used to support understanding of omni directional relationships, interdependencies and their relative weightings. The use of business intelligence techniques, such as scorecards based on absolute measures or targets, relative weightings and variations to expectations and economic tools such as composite indices based on measures and indicators linked to the system elements provides a means of ongoing monitoring of the condition of the system, discovering relationships and introducing/adjusting initiatives.

The meta-framework provides a mechanism for more balanced representation of societal outcomes and condition. The four outcome perspectives included supports the extension from single, narrow measures of output or value-add as the sole determinants of progress and success to a more diverse set that reflect the balanced and interdependent interests and determinants of societal wellbeing. The inclusion of the balanced perspectives enables comparative analysis of outcomes across perspectives that have a greater correlation with the diverse interests and values of society than single measures such as GDP. The focus on and use of single measures of performance and progress as the basis of the policy narrative, create a corresponding bounded narrative and discourse.

The value of understanding complexity is the ability to explain how interests converge. This is made viable through the use of the meta-framework and is critical in establishing an explanatory narrative. The combination of information and the meta-framework structure supports a narrative that links cause with effect at both output and outcome levels across activities and outcomes that are relevant to people. It further allows, and arguably requires interests to generate narratives within similar constructs as the basis for community conversations.

Prediction and designing interventions to create value within complex contexts

The relationship between prediction and intervention design is the core of policy making. The meta-framework representation brings outcomes, on-ground practice and formative factors into the foreground as equal, unweighted building blocks or elements of the system.

The subsequent condition analysis within the meta-framework cause/effect construct enables the formation and consideration of predictive "what if" questions that can be both responsive and creative in nature. This predictive capacity is based on the multi-dimensional and multi-perspective structure and the understanding of omni-directional relationships and interdependencies amongst the outcome, practice and formative elements.

The framework as both a visual and modelling construct is designed to discover the relationship between a change in one element on others within the system; or if a change in a

key element is the goal, which other elements and what level of change in them will contribute to this goal, over what time frame or with what level and velocity/intensity of change in the drivers.

Having the options "on the page" used in collaborative co-design models, enhances the potential to apply a productive mix of interventions, conjointly calibrated as a set to deliver the outcomes and value sought. The multi perspective map supports and validates the inclusion of diverse perspectives highlights the necessity of inclusion and inclusive, joint decision-making processes as a complement to the meta-framework structure.

Part of the benefit is derived from the joint application of data, modelling and observation, adoption of socio-technical principles to the introduction, analysis, conclusions and use of their predictive capabilities. An underlying premise the "dynamic systems logic" and the "what if" that is the management stance inherent in the meta-framework, is that decisions and their activation also provide a basis for further discovery, rather than solely providing an absolute solution to a problem.

The complementary *development pathways analysis* links the capitals to the activities or determinants, enabling detail analysis and intervention design to move from the current to required condition as identified within the *contribution table*, providing the structure for stakeholder contribution to system improvement and its management.

Managing complexity

A key advantage of the meta-framework is its support for simultaneous management of the system as a whole and elements within it; enabling complexity and reductionist models to work together using the meta framework, it supplementary tolls as described above and other management and modelling techniques.

Collaborative design and management mechanisms provide an organisational reflection of CAS, livelihood and place-based mechanisms as well as those reflective of complex social challenges etc within place. While attractive as a concept, the lack of a meta-framework to support thinking frames and to help people understand "fit to the system", such initiatives often lose effectiveness.

The capacity to focus on improvement in a particular element of the contextual landscape based on consideration in the systems context and then placing it back into the system to analyse broader cause/effect and to test for unforeseen positive and negative consequences is an advantage of this meta-framework approach. This capacity assists to respond to multiple signals arriving with varying intensities and timing.

The design and management phases require leadership, structure and process that reflects the openness, diversity and dynamics represented in the meta-framework, its use and focus on the duality of the "capitals" framework as a stock (often represented as the outcomes in the model) and as a flow from either stock or development (input or initiative) into activity.

Openness to new signals received as a result of monitoring progress from initiatives and the system; and to change arising from learning is the basis of endogenously derived dynamics. This requires a level of understanding of the time critical nature and depth of information required to manage specific risks and opportunities. Micro level data is the foundation of business intelligence and practice dynamics and the input into structural economic analysis.

The adoption of an alternate heuristic is the essential pre-requisite to creating value from it. As with the sustainable livelihoods approach, the charge of "too complex" is made of the meta-framework approach when the framework is introduced "cold". To mitigate this risk, the introduction of the concept by assembling (to complement the dissembling/reassembling capability (Ostrom, 1999)), as a means of moving from the dimensions and elements of initial motivation and interest to designing a system that binds the important perspectives and dimensions (Hoppe, 2018) and as the initial explanatory introduction is important in creating initial engagement.

Evaluating and modelling

The lack of evaluation across Australian Government recurrent and capital investment is mirrored by other levels of government. Where evaluation occurs within programs, it is framed within the original investment design parameters relatively linear and premised on narrow program objectives and efficiency.

The dynamic nature of the management model arising from the meta-framework results in a broader focus to evaluation used in tandem with ongoing monitoring and adaptation.

Importantly, the dynamic nature of the system logic meta framework and its complementary management mechanisms embed the concept of monitoring and evaluation as part of the management culture.

Evaluation and modelling are synonymous. The adoption of a multi-perspective and dimensional approach to evaluation, leads to modelling as a means of understanding progress, cause/effect and prediction. The meta-framework provides an architecture for this, ensuring that modelling and the techniques are applied as subsidiary to the considered questions arising from the analysis.

As noted in Chapter Three, the use of business intelligence approaches is consistent with the framework in both ordering and representing information. There is a match between the design of the meta-framework and the characteristics of approaches included under the broad notion of "gross measures of progress' (Allin & Hand, 2017) and the characteristics of complexity economic, in particular the .inclusion of a focus on formative factors identified by Arthur and complexity economics (Arthur, 2013).

The meta-framework architecture supports the integration of short-term monitoring and medium to longer term modelling to help people understand the meaning and implications of the data signals they are receiving from the system. Technique is subsidiary to purpose:

- Business intelligence techniques are applied to help understand condition, short term dynamics and associated cause/effect relationships, where the effect parameters can be tightly set and weighted in importance – the purpose focused on the consequence of external drivers and internal change initiatives captured in qualitative and quantitative terms;
- Traditional economic modelling tends to focus on lagged relationships between a dependent and the influencing factors which emerge over time and captured in official statistics.
- The construction of indices is compatible with both sources;
- The meta-framework an architecture on which to explore machine learning techniques to enhance both understanding of and prediction within the system and the mediation effects of changing priorities and behaviour.

A significant challenge within this theme is to move decision dependence from highly accurate, point estimates for simplified or proxy dependent variables towards the use of more specifically defined variables matching the policy outcomes sought and where the estimates and relationships may initially be more broadly defined but resolved over time.

The consideration of evaluation with the inclusion of modelling, provides the stage in the policy making loop that leads back to the recursive adaptation of policy settings based on the multi-perspective learning, understanding and explanation through the collaboration and co-design supported by the meta-framework.

Conclusion

It is possible to translate concepts such as complex adaptive systems from ideas into tangible frames to help people to make more informed policy and strategy decisions reflective of context and its influences. The dynamic systems logic inherent in the meta framework and associated tools demonstrates a particular example of this translation from theory into practice. The meta-framework approach provides a heuristic that is arguably of value to policy makers and managers of complex public programs, it also provides a frame for academics to analyse policy making.

The meta framework approach has demonstrated utility through the cases in a number of place-based contexts on both providing basis for better understanding, explaining and designing an initial intervention mix that can be adapted and enhanced through implementation and evaluation in practice. In doing so it also demonstrates some potential in addressing challenges identified in the activation of place-based and livelihood approaches and policy.

The research does not claim resolution to the important challenge of establishing a more realistic representation of the factors affecting policy as the foundation to improved policy making. but does claim some progress in both theory and practice. An additional benefit of the heuristic and meta-framework approach is that it enables complementary approaches to

engagement and complexity to be applied in context, contributing to additional utilisation and benefit from them.

Three significant challenges arise in adopting approaches founded in complexity and a stance that recognises the potential to create value from its representation and understanding:

- Generating a cultural shift in the design of policy and strategy from an event and product towards the collaborative management of a dynamic system that is focused on protection and further development and application of capital stock, arguably the basis of the performance, productivity and resilience of a place;
- Transforming the positioning and purpose of public policy/strategy towards collaboratively "creating value" directly and from a flow-on perspective, by jointly contributing community capitals to achieve sustainable, societal livelihoods and quality of life goals. This positioning is an alternative to problem solving and gap closing as the primary purpose; arguably a paternal and authoritative stance; and
- Developing data systems and information that provides the comprehensive suite of signals reflective of the specific meta-framework architecture that meaningfully describes the system dynamics in a form that supports recognition of importance and priority as the basis for further analysis and translation into meaning and action across the system.

Where to?

The future for this partially resolved approach reflects the participative, socio-technical and learning orientation applied within the research and case studies.

The dimensions of "where to?" include:

- Policy Practice;
- Policy Theory; and
- The manner in which knowledge and information is framed and collaboratively utilised within and between practice and theory.

Adoption in practice is considered largely a social dimension is captured in strategic change management thinking. The adaptive systems meta-framework deviates significantly from linear, reductionist, satisficing policy making heuristics, models and practice; including within associated quantitative assessment. Adoption of alternatives is not solely based on demonstration, it requires an engagement process, supported by valid applications and players.

At its core, the approach is premised on encapsulating reductionist models within a structured systemic approach, changing the nature of collaboration and the development of policy narratives and discourse. This assists in considering degrees of participation in whole system policy making, the ability to move from the overall meta-framework and to a reduced set of blocks dissembled from the whole, facilitates collaboration of interests at this reduced level.

The importance to then re-assemble and to consider the potential technical and social propagation, and its potential for contestability, is considered important. This re-introduces aspects of power, authority and competing interests to the notion of creating value. The meta-framework approach helps create transparency around these challenges, as identified for other dimensions through the research, bringing them to the forefront to enable both practical and theoretical aspects of equitable, collaborative behaviour to be considered.

Collaboration, practice and theory factors are interdependent. The capacity to utilise the meta-framework to generate knowledge and Information and its role in the delivery of a subsequent narrative is valuable. It helps reinforce the policy role of government and its complementary contribution and practice to other public and private institutions as they operate interdependently in a place, and is essential to providing the signals engender the technical and cultural change in the roles and practice of governing and succeeding in place.

Development of these narratives is about:

- Better using existing information in forming and promoting policy narratives in a manner that more effectively resonates and promotes inquiry from the diverse interests in place and specific communities and their values; and
- Creating new forms of analysis, modelling and from this information based on emerging the digital capacity and associated, emerging techniques is an important adjunct to and basis of utilisation of meta-framework approaches. Information that clarifies interdependencies, system dynamics and multiple trajectories, using traditional techniques such as indices, business intelligence and new technologies that link machine learning to the meta-framework architecture is central to applying these CAS approaches.

The consideration and adoption of broader representations of value, in terms of capitals, outputs and outcomes as a means of identifying progress and resilience capacity as applied within a meta-framework approach with its cause/effect explanatory narrative, is an undeveloped, and arguably important field. These frameworks become base-line representation of condition, dynamics and contestability upon which to measure progress.

The development of a realistic and broadly relevant and meaningful multi-perspective policy narrative as a component of policy making requires the use of a matching heuristic. While it is demonstrated that it is possible to translate the principles of a CAS to a heuristic that integrates key public policy making challenges the challenge remains in supporting and achieving uptake.

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